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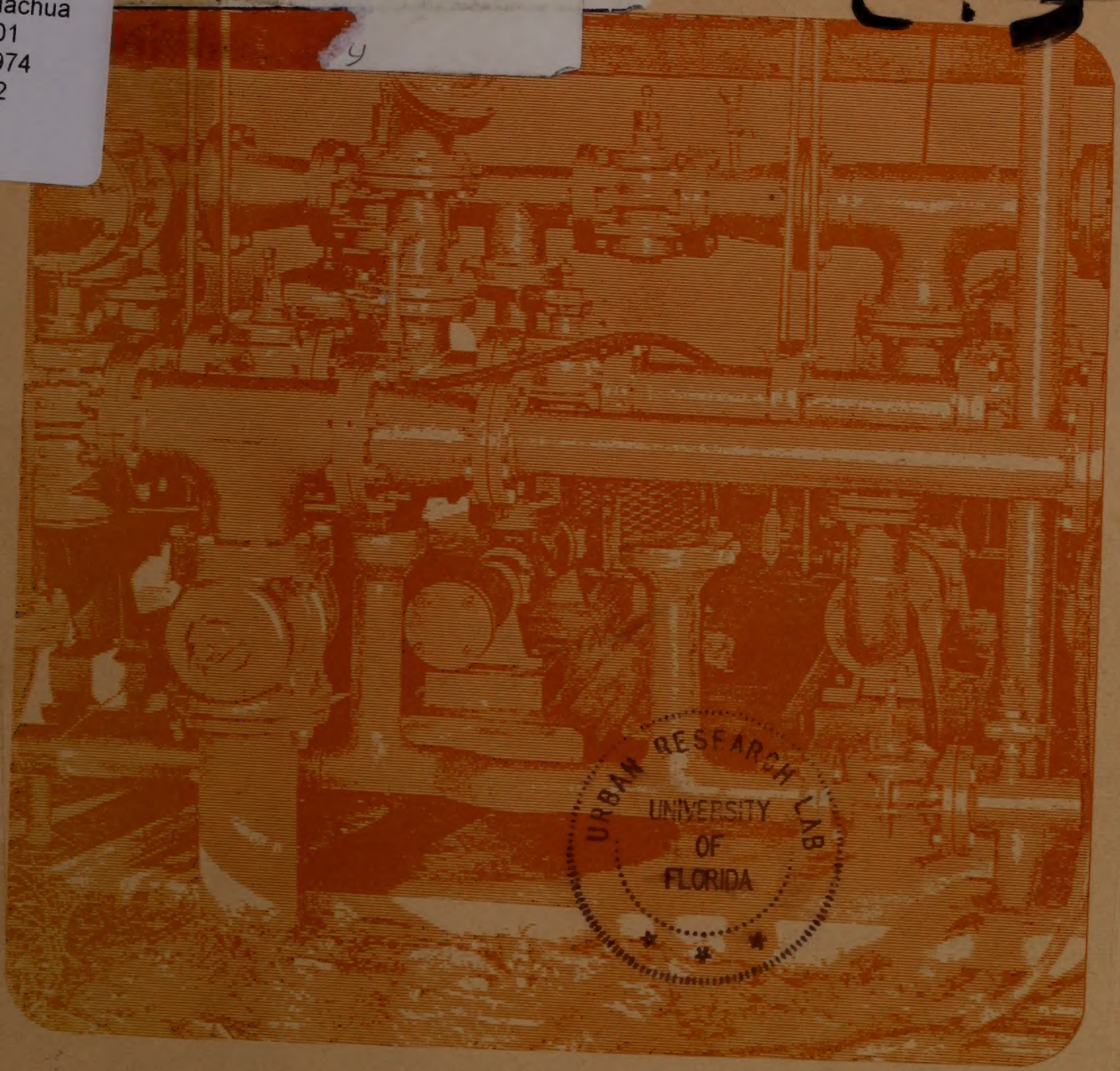

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WATER AND SEWER DEVELOPMENT PLAN

ALACHUA COUNTY, FLORIDA

Prepared for the

NORTH CENTRAL FLORIDA

REGIONAL PLANNING COUNCIL

By

Black, Crow and Eidsness, Inc.
Engineers
Gainesville, Florida

Project No. 219-73-50 HUD No. CPA-FL-04-29-1036

December, 1973

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Report presents water and sewer development plan to year 1990 for Alachua County. All available background information, as recent as October 1, 1973, has been compiled as a base for the recommendations made. The report contains three parts: Part I is background information; Part II is the water and sewer development plan; and, Part III is appendices. Part II contains information on the most economical approach toward providing water facilities and sanitary facilities to the nine incorporated areas of Alachua County. Indications are that by 1990 approximately 90 percent of the population will be located in the Gainesville Urban Area. The remaining 10 percent will be in the unincorporated areas and the eight rural incorporated communities. Conclusions and Recommendations are contained in Section 13.0 of the report.

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PREFACE

At the August 15, 1973, meeting of the North Central Florida Regional Planning Council, the contract for an engineering study to formulate the Water and Sewer Development Plan for Alachua County was awarded to the engineering firm of Black, Crow and Eidsness, Inc.

The report presented herein includes the nine incorporated communities and the unincorporated areas of Alachua County. Preparation of this report has been financed in part through a comprehensive planning grant from the Department of Housing and Urban Development.

This study has been prepared to aid in the systematic and rational development of water and sanitary facilities in Alachua County. Many factors need to be considered when planning for water and sewer facilities on a regional basis. One of the more important factors is the existing and proposed land use and its correlation to population characteristics and projections. Existing and planned facilities have been analyzed to determine the most realistic and economical program for development of regional facilities to the year 1990. The North Central Florida Regional Planning Council has contributed greatly toward the preparation of this report. The information contained in Sections 1 through 9 (Part I) is a summary of all background information which might be considered pertinent in the preparation of a water and sewer development program for Alachua County. Part II contains the actual water and sewer development program for Alachua County to the year 1990.

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PART I

BACKGROUND INFORMATION

SECTION 1

INTRODUCTION

1.1 CERTIFICATION

The Department of Housing and Urban Development (HUD) requires all areawide planning organizations to be certified in water and sewer planning in order to maintain continued eligibility for funds under the HUD Water and Sewer Facilities Grant Program. In general, this certification program requires the areawide planning organization, i.e., the North Central Florida Regional Planning Council, to establish a comprehensive and functional planning program for water and sewer facilities throughout the planning area.

The North Central Florida Regional Planning Council has an interim certification by the Department of Housing and Urban Development for water and sewer planning and programming for the period January 1, 1973, to January 1, 1974 (Appendix A). Continued funding for local projects through HUD programs is contingent upon continuing planning efforts which are intended to promote efficient and orderly growth of water and sewer systems.

The Environmental Protection Agency (EPA) formerly administered their water pollution control facility grants under the Federal Water Pollution Control Act, PL 84-660. This act was superceded in September, 1972, by the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) which provides federal assistance for the funding of qualifying water pollution abatement projects, such as wastewater treatment plants.

Section 208 of this law specifically provides for the development of comprehensive water quality management plans aimed at controlling pollution and maintaining regional water quality. Federal regulations requiring that all recognized regional planning agencies complete Comprehensive Water Quality Management Plans by July 1, 1973, have also been superceded by this act. Such plans are now required under this act to be completed no later than two years after the designation of an areawide planning agency by the governor of each state.

The HUD and EPA programs overlap to such a degree that the water/sewer planning requirements of HUD are included within the more comprehensive planning necessary for the EPA water quality planning program. As a result of the progress to unite and simplify application and planning procedures on the federal level, one natural

development is that the EPA requires each planning agency to be certified in water and sewer planning by HUD prior to being eligible for EPA grants. Because authorized funding has not been made available for planning grants under Section 208 of PL 92-500, the Environmental Protection Agency presently requires only that an areawide planning agency be certified for water and sewer planning by the Department of Housing and Urban Development. This is required in order to be eligible to receive federal grant monies for water pollution abatement facilities as provided for in applicable federal legislation.

In order to satisfy both EPA and HUD planning requirements the North Central Florida Regional Planning Council made initial application for a 3(c) grant under PL 84-660 for a Comprehensive Water Quality Management Study to the EPA in November, 1971. The Council learned earlier this year that no funds will be available for this project from this source in the future. Therefore, because of the necessity for initiating progress on water and sewer planning, the Council has utilized local funds to compile this plan for water and sewer development.

The council staff aided in the completion of this study by providing background and technical information wherever possible and contributing to the composition and editing of the text. It is anticipated that this product will aid in maintaining continued eligibility for both HUD and EPA grant monies for water pollution abatement projects.

This study will address itself primarily to water and sewer planning; however, all readily available information on water quality, hydrology, etc., will be summarized in order to prepare a background for the proposed Water Quality Management Plan that will be required by the Environmental Protection Agency at a later date.

1.2 AUTHORITY

The North Central Florida Regional Planning Council was established in December of 1968 by joint resolution of the Alachua County Commission and the Gainesville City Commission. Authority for the creation of such councils is granted by Chapter 160 of the Florida Statutes, as amended. The Regional Planning Council consists at present of Alachua County and its communities.

Under the provisions of Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 and Bureau of the Budget Circular A-95, the Regional Planning Council has been designated as the clearinghouse for Alachua County. Application has been made to the Department of Housing and Urban Development for Comprehensive Planning Certification (MPD-64-5-1A-II) and for Water and Sewer Certification (MPD-6415-2A) in fulfillment of recent planning requirements for grant applicants.

1.3 PURPOSE AND OBJECTIVES

The purpose of this report is to present an areawide plan for the development of water and sewer facilities in Alachua County, Florida. All existing facilities are inventoried. By using background data, trends, and evaluations, the needs of the county are projected through the year 1990, and a plan for the efficient and orderly development of water and sewer facilities is outlined.

All available information on water quality will be incorporated in this report which is considered pertinent to the development of a water and sewer plan and necessary for the development of a water quality management plan that eventually will be required by the Environmental Protection Agency. This supplementary water quality data will consist only of readily available material and references for additional data; no new data will be generated.

HUD also requires flood and storm drainage certification for a planning agency to retain eligibility for this category of federal grants. This report will present a summary and progress report on the comprehensive drainage planning efforts currently being accomplished by another local consultant, Sverdrup and Parcel and Associates, Inc., for the North Central Florida Regional Planning Council. Their report is scheduled for completion in July, 1974.

1.4 SCOPE OF PROJECT

This report covers all aspects of area economy and resources which are related to the development of water and sewer facilities within the boundaries of Alachua County, Florida. In addition to a discussion of the facilities within the county, discussion is presented on population characteristics, economics, public utilities and services, land use, natural resources, and water resources in order to provide adequate background material for optimum planning decisions.

No attempt will be made in this report to formulate new data on drainage or flood control. However, existing information on the Comprehensive Drainage and Flood Plain Designation Study currently being prepared for the Gainesville metropolitan area will be summarized so that general related planning needs may be outlined at this time. Likewise, no new data will be generated on water quality in the county. However, all readily available information will be collected, summarized, and referenced in order to provide a base upon which a Comprehensive Water Quality Management Plan for Alachua County could be constructed at a later date.

SECTION 2

AREA DESCRIPTION

2.1 LOCATION

Alachua County is located in the north central section of the Florida peninsula as shown on Plate 2-1. The Santa Fe River on the north separates Alachua County from Columbia, Bradford, and Union counties. Putnam County lies along most of the eastern boundary, with Clay County just touching at the northeast corner. Marion County abuts roughly two-thirds of the south boundary. Levy County borders Alachua County to the south and west and Gilchrist to the west. All of Alachua County's territory falls within the 29°25' and 29°57' parallels of latitude north and the 82°00' and 82°40' meridians of longitude west.

The county is one of the oldest in Florida, having been established in 1824. Gainesville has been the county seat since 1854, and is presently a fast growing city with approximately 68,989 people (1972 July update). These figures represent 60 percent of the total population of the county which was estimated to be 115,824 in the 1970 Census. The city is near the center of the county, about 55 miles from the Gulf of Mexico to the west and 70 miles from the Atlantic Ocean. The county has a land area of 568,320 acres or 888 square miles. These figures do not include the bodies of water representing about 74 additional square miles.

The present plan applies to all of Alachua County, including that part of the community of Melrose falling within Putnam County as well as the city of Gainesville and surrounding areas. Plate 2-2 presents a general map of the planning area.

2.2 CLIMATE

The climate in Alachua County is mild, with a mean annual temperature of 70.2 degrees and an average yearly rainfall of approximately 52 inches. Precipitation varies widely from year to year, particularly in the summer months. Alternating wet and dry cycles of several years' duration are observed. Most of the rain, an average of about 36 inches per year, is tropical in nature, falling during the summer months as thundershowers. About 16 inches of the yearly average comes as winter rain of the cyclonic or frontal type, usually slow and drizzly and followed by a drop in temperature.

Daily average temperature for the summer months varies little from year to year, but a wider variation is observed during the winter when cyclonic storms frequently

bring cold weather from the north. Frost depends upon these storms. Killing frosts can be expected, on the average, over an 80-day period each year, from December 4 to February 22. Humidity is rather low in the area. Fogs occur during 30 to 40 days each year, generally in the early morning in winter. The area has never received serious damage from hurricanes and chances for a hurricane within any one year are considered to be in the 3 to 4 percent range.

Climatological data can be obtained from the U. S. Weather Bureau publications for five stations within the county. Two of these stations are in the Gainesville area and the other three are located in High Springs, Melrose, and Island Grove. The one station at Gainesville, 3 WSW, keeps records of precipitation, temperature, and evaporation and has both recording and nonrecording gages. This station also keeps records of soil temperatures at various depths. Records cover a period of 13 years, beginning in 1953. Precipitation and temperature records for the area are also available for a period of more than 60 years up to and including 1956, from the old University of Florida station at Gainesville. Table 2-1 shows the average monthly temperature and rainfall in Gainesville.

2.3 TOPOGRAPHY

Alachua County is located in the topographic division of Florida known as the Central Highlands and may be divided into two major land resource areas each typified by a characteristic physiography. The North Central Florida Ridge area is described as having a gently undulating land surface. In contrast, the Atlantic Coast Flatwoods area is generally of low, somewhat flat terrain having numerous swamps and large shallow lakes. Elevations in Alachua County generally range between 50 and 210 feet above sea level.

The topography of the county owes it character to two major factors. The first involves alternating advances and recessions of the sea during each of the major Pleistocene (10,000 to 2,000,000 years ago) ice ages. Terraces or wave-cut beaches eroded into local land surfaces wherever each advance remained stationary before ultimately retreating. As many as five terraces represented as hills or rises in local land surfaces ranging to over 200 feet in elevation, have been identified in Florida. At least two of these terraces, the Okefenokee, at about 150 feet elevation, and the Wicomico, at about 100 feet elevation, have been identified in Alachua County.

The second factor is the solution by ground and surface waters of the relatively soft limestone formations underlying much of the area. The term karst topography is used where such solution has served to divert waters to underground routes or create lakes by forming depressions in the limestone down to the groundwater level. Such differential solution has been a significant factor in creating lakes, eliminating surface drainage by streams, and forming sinkholes in some parts of the county.

Much of the north and northeastern portion of Alachua County is a nearly level plateau-like area varying in elevation from 150 to 200 feet. Relatively impermeable clayey sands beneath the sandy surface soils have caused stream drainage to develop radially outward from the plateau. During an earlier stage of development this plateau most likely served as a natural drainage divide between the Atlantic Ocean and the Gulf of Mexico. Some of the present drainage still reaches the Gulf by way of the Santa Fe River to the Suwannee River and then to the Gulf. Many swampy areas occur throughout the plateau. According to Pirkle (1956b), these swampy areas primarily occur in depressions formed either by differential compaction of the Pleistocene surface material or by the solution of the underlying calcareous rocks of the Hawthorn formation and Ocala limestone. These areas owe their water retention capabilities to underlying impermeable clays beneath the surface sands.

The western portion of Alachua County is a plains region having elevations ranging from approximately 50 to 100 feet and notably characterized by the lack of a surface drainage system. This relatively flat limestone plain area is an extension of the Williston limestone plain of Levy County and has been formed primarily from the breaching by subaerial erosion of the Ocala arch and modified by subsequent Pleistocene seas. The Hawthorn formation which probably overlaid this area in the geological past has been removed by mechanical wash or has been carried away in solution, leaving the deeply pitted and eroded Ocala limestone often within a few feet of the surface, covered with a thin layer of loose sand. The loose sands or clayey sands lying above the Ocala limestone tend to mask the irregularities of the limestone surface and often form sand hills or ridges in the southwestern part of the county. The solvent action of groundwater is more evident on this plain than any other part of the county. Sinkholes and other solution features are common.

The southcentral and southeastern portions of Alachua County are characterized by flat bottom lakes, prairies, and erosional remnants of the plateau. Paynes Prairie, Levy Lake, and Kanapaha Prairie are examples of this area. The level bottoms of the prairies and lakes have been observed to occur somewhat uniformly at elevations slightly below 60 feet above mean sea level (msl). Of the three different types of flat-bottomed depressions all appear to be associated with the local groundwater level suggesting that the potentiometric groundwater level may be the temporary base level of the area. A general contour map of the county may be seen on Plate 2-3.

2.4 SOILS

An extensive soil survey of Alachua County was compiled in 1940 and published in 1954 by the United States Department of Agriculture, Soil Conservation Service, in cooperation with the University of Florida Agriculture Experiment Station. This publication contains a complete description of all soil series in the county and color

soil maps at 1:48,000 scale. A general soil map of Alachua County was published in 1967 by the United States Department of Agriculture, Soil Conservation Service. The St. Johns River Basin report compiled by the Department of Agriculture included their general soil map of Alachua County as represented on Plate 2-4. The accompanying legend provides an explanation of map soil types. In general, the Pleistocene terrace deposits, primarily thick acid sands, comprise the chief parent material for the soils in the area. Table 2-2 lists the soils of Alachua County by type, acreage, and location.

2.5 GEOLOGY

Alachua County is underlain by several hundred feet of unconsolidated to consolidated deposits of sand, clay, marl, limestone, dolomite, and dolomitic limestone. In Alachua County, the oldest formation penetrated by water wells is the Lake City limestone of the Eocene age. The Oldsmar limestone which underlies the Lake City limestone is probably fresh-water bearing, at least in part. The older rocks of Teritary to Cretaceous age, which lie below the Oldsmar, contain highly mineralized water. Only the fresh-water bearing formations are discussed in this report. The formations are grouped according to their geologic age and are described from the oldest to the youngest; that is, from the Oldsmar limestone of the Eocene age, approximately 60 million years old, to the Pleistocene and recent surface deposits.

The lowermost formation of Eocene age is the Oldsmar limestone which lies at a relatively great depth under Alachua County, and is not penetrated by water wells. The Oldsmar is a finely fragmental and fossiliferous marine limestone which has been partially to completely dolomitized. It contains minor amounts of the evaporites, gypsum and anhydrite, and irregular lenses of chert. Information on the character of the Oldsmar comes primarily from oil test wells.

The Lake City limestone which overlies the Oldsmar limestone is the oldest formation from which supplies of freshwater are obtained in the county. This formation consists of a grey to brown finely crystalline dolomite and dolomitic limestone including many beds of softer fossiliferous limestone and seams of peat or lignite. The nearest this formation approaches the surface is in southeastern Alachua County where it has been found at 150 feet below mean sea level. The Lake City limestone is approximately 440 feet thick beneath the city of Gainesville.

The Avon Park limestone, which overlies the Lake City limestone, is chiefly a dark brown to tan, granular, hard, dense to porous dolomite that in places contains a few beds of cream-colored limestone. The Avon Park is near the surface in southwestern Alachua County, where it is also thinnest. It reaches a thickness of about 200 feet in the vicinity of Gainesville.

The Ocala limestone overlies the Avon Park limestone and is the oldest rock exposed at the surface within Alachua County. The upper part of the Ocala limestone is a soft, chalky, white to cream-colored coquina limestone. Lower portions consist of alternating beds of hard to soft, tan to brown crystalline to dolomitic limestone and coquina. Boulders and irregular masses of chert or flint are common near the top of the Ocala limestone and can be seen on the surface where the Ocala occurs at shallow depth. Cavities up to three feet in depth are common and cavities as large as 40 feet deep have been reported in western Alachua County by well drillers. Younger materials consisting of sand, clay, and vertebrate fossils have filled many of these cavities, solution pipes, sinkholes, and depressions in the Ocala limestone.

The Ocala limestone is exposed at the surface in southern and western Alachua County. Where present at the surface, a limestone plain has been formed which is characterized by solution features typical of karst topography, i.e., sinkholes, solution pipes, caverns, prairies, etc. In western Alachua County, elongated solution depressions, cave passage trends, and other physical features appear to reflect control by a northeast-southwest or northwest-southeast fracture system in the Ocala limestone.

The Suwannee limestone of Oligocene age has been found to overlie the Ocala group in the northwestern part of Alachua County. Due to their lithologic similarity, it is often difficult to distinguish the Suwannee and Ocala except by characteristic faunal elements. North and northeast of Gainesville, the Suwannee reaches its maximum thickness in the county of 30 to 50 feet. The formation consists of hard to soft beds of white to tan limestone with some sand and dolomitic limestone. Chert is usually present.

The Hawthorn formation, a marine deposit of Miocene age, overlies the Ocala limestone and the Suwannee limestone except in parts of western and southern Alachua County where it is irregular or absent. The Hawthorn formation consists of thick beds of clay and sandy clays ranging in color from blue and grey to green and containing beds of sandy phosphatic limestone. It usually forms a gently rolling surface, although in some places a relatively rugged hill and valley terrain have been formed. The clay beds of the Hawthorn formation are the prinicipal confining strata which maintain water under artesian pressure in the Floridan Aquifer.

The coarse clastic deposits of the Citronell formation are a nonfossiliferous deposit consisting of multicolored sand and clayey sand which occur only in the northeastern tip of Alachua County. These sediments have a thickness of up to 22 feet and are relatively insignificant to this report.

The Choctawhatchee formation is found only in northeastern Alachua County. Found in thicknesses from 10 to 30 feet, the formation is comprised of yellow to cream-colored fossiliferous clay and marl.

The Alachua formation of Miocene to Pleistocene age forms low rolling sandhills over the Ocala group in the southwest part of the county. This formation consists primarily of terrestrial white and grey sand deposits, and is often found interbedded with phosphate pebbles and sandy clays. Thicknesses range from 25 to 35 feet.

Several terraces consisting of marine sediments which were formed during the early interglacial stages of the Pleistocene epoch comprise the older Pleistocene terrace deposits. These consist mostly of unconsolidated tan, yellow, and grey sands and range from 20 to 45 feet thick in the county. The general geologic map, Plate 2-5, presents the approximate surface exposures of each formation at the earth's surface if the soil were stripped away.

The geologic structure of the region is aptly described by Pirkle (1956b) as follows:

> The principal geologic structure of the area is the Ocala uplift, an anticlinal fold or arch whose crest transverses southwestern Alachua County. The folding has arched beds of Teritary age and has brought limestones of the Ocala group to the surface or close to the surface along the crest and flank of the uplift. The main axis of the uplift lies several miles west of Alachua County and, in general, parallels the north-south axis of the Florida peninsula.

The regional dip of this structure is east-northeast and averages 6 feet per mile with some local variation associated with lesser folds or fault zones. The geologic cross sections in Plate 2-6 show several lesser folds on the flank of the uplift which were probably caused by the same orogenic forces that created the Ocala uplift. According to Pirkle (1956b), the most prominent of these lesser folds is one whose crest is in northeastern Alachua County in a triangle defined by Waldo, Melrose, and Hawthorne. The configuration of the surface of the limestone indicates that the structure is a double plunging fold that plunges to the northwest and southeast.

Table 2-3 presents a representation of the formations discussed in this report in relation to the appropriate geologic time of deposition and to each other in proper time sequence.

2.6 HYDROLOGY

2.6.1 Surface Water

Surface waters may gain water from or lose water to the groundwater table. Many variations of ground-surface water interaction exist in Alachua County; the actual

relationship between surface and groundwaters depends upon the local geologic conditions with each body of water having its own characteristics. Surface water levels and stream flows vary widely from season to season and year to year depending on rainfall and climatic conditions.

The three most useful figures expressing stream flow, as given in Florida Geological Survey Report of Investigations No. 35 (1964a), are the average, minimum, and maximum flow. Average flow values are important because they indicate the normal flow and provide a guide determining long-term quantities flowing through the stream or spring. Minimum values provide the limiting factor in the ultimate use of a stream not having dams and storage reservoirs. Maximum flow values are valuable for planning the use of flood plains and for building river appurtenances. In general, determining the variation in flow values aids in planning the full use of a stream.

From Plate 2-7 it may be seen that Alachua County is divided between two major drainage basins. Drainage in the southeast portion ultimately travels through the St. Johns River to the Atlantic Ocean. To the northwest the drainage system is part of the Suwannee River basin which drains to the Gulf of Mexico.

Most of southwestern Alachua County, including the Gainesville urban area, is within an area of approximately 300 square miles which has no surface outflow. The few small streams in the area, most notably Hogtown Creek, drain into sinkholes to recharge the Floridan Aquifer.

Drainage to the Suwannee River is through the Santa Fe River which forms the entire northern boundary of the county. Drainage to the St. Johns River is through Orange Creek in the southeastern tip of the county. Hatchet Creek, the headwaters of the basin, flows into Newnans Lake, then to Orange Lake by way of Prairie Creek, Camp's Canal, and River Styx. Lochloosa Creek enters into Lochloosa Lake, then, by Cross Creek to Orange Lake and out Orange Creek. The combined drainage area of Orange and Lochloosa lakes is 323 square miles. The average flow from southeastern Alachua County into the St. Johns basin is 97 mgd. Table 2-4 provides a summary of available data on discharges, drainage areas, and types and period of record for some streams and springs in the county.

There are a total of 119 lakes in Alachua County. The 44 named lakes have a combined area of 45,711 acres and the 75 unnamed lakes represent 3,243 acres for a total lake surface area of approximately 76.4 square miles. Table 2-5 contains a listing of those lakes located in the county by the river basin. Although lakes are important for recreational activities in the county, they are unimportant as sources of public water supplies.

2.6.2 Groundwater

Groundwater is water in the zone in which all pore spaces are completely filled with water. The term aquifer is defined as a rock formation or material in the zone of saturation that is permeable enough to yield usable quantities of water to wells or springs.

Groundwater may occur under water table (unconfined) or artesian (confined) conditions. In an unconfined aquifer the water table is the upper surface of the zone of saturation and is free to rise or fall. In an artesian or confined aquifer the water is confined under greater than atmospheric pressure by overlying, relatively impermeable beds. The water in a well drilled into an artesian aquifer will rise above the base of the confining bed. If the water rises above the land surface it will flow naturally and may be termed a flowing artesian well. The potentiometric surface of an artesian aquifer is the surface to which water will rise in a tightly cased well that penetrates the aquifer.

Springs may be defined as concentrated discharges of groundwater appearing at the earth's surface as a current flowing water (Todd, 1967). There are several general types of springs which occur in Alachua County. Gravity springs occur where the water table intersects the land surface, as in a hillside or depression. Glen Springs, Boulware Springs, and the springs which emerge from the side of the Devils Millhopper are of this type. Artesian springs occur where the confining layer overlying an artesian aquifer is breached. Magnesia Springs and Poe Springs are of this type.

The value of Alachua County springs is mainly recreational and aesthetic. Glen Springs, Magnesia Springs, Poe Springs, and several smaller springs furnish or have furnished in the past, water for swimming pools or recreational areas. Boulware Springs near Gainesville furnished the city of Gainesville water supply prior to 1913 and is still used to supply low dissolved solids water for boiler feed in power generating facilities. The largest spring in the county is Poe Springs near High Springs which flows at a rate of about 40 mgd into the Santa Fe River. The other springs in the county have flows generally well under 1 mgd.

2.6.3 Wells

Florida Geological Survey, Report of Investigations No. 35 (1964a), provides an excellent description of well yield limitations and general hydraulic conditions resulting from well pumping. For the purpose of brevity their discussion is as follows:

> The amount of water that can be pumped from a well may be limited by any of several factors. In general, the yield is determined by the extent to which water levels may be lowered without adversely affecting the quality of the water, or making the cost of obtaining it prohibitive, or causing the well to fail. Lowering of the water level inevitably accompanies pumping and is necessary to cause

water to flow into the well from surrounding formations. The amount of lowering (or the drawdown) is approximately proportional to the rate of pumping.

The relationship between the rate of pumping and the drawdown in a well is often used to estimate the drawdown in or the yield of a well. This relationship is called the specific capacity of a well and is controlled by several factors; principally the ease with which the aquifer transmits water, the capacity of the aquifer to store water, the well construction, the conditions under which water is recharged to the aquifer and discharged from the aquifer, and the length of pumping time.

The specific capacity is the pumping rate divided by the drawdown. For example, if a well is pumped at the rate of 200 gpm (gallons per minute) and if the water level is lowered 20 feet, its specific capacity is 10 gpm per foot of drawdown. Accordingly, if the specific capacity of a well is 10 gpm per foot of drawdown, the implication is, within certain limits, the yield of the well will be increased 10 gpm for each additional foot of drawdown.

The drawdown may, however, be limited to the amount which, if exceeded, would allow saline or highly mineralized water to move into the well. The possibility of the drawdown being limited by the intrusion of saline or highly mineralized water is greater in very deep wells that have penetrated relatively impermeable zones in the lower part of the aquifer than in shallower wells.

The ultimate drawdown in a well, other things being equal, depends on how the drawdown affects the recharge to the aquifer and the discharge from the aquifer. Under natural conditions before withdrawal the recharge to an aquifer is balanced by the discharge from the aquifer, except for temporary differences due to changes in the amount of water stored in the aquifer. After pumping from the well begins, the natural balance is upset. For a time after pumping begins, practically all of the water is pumped from storage in the aquifer immediately surrounding the well. The pumping of water from storage lowers the water level, and thereby creates a cone of depression around the well. As pumping continues, the cone of depression deepens and broadens until ultimately a new balance is established wherein the rate of recharge is once more equal to the rate of natural discharge, plus the rate of withdrawals. The new balance may occur through an increase in the rate of recharge if circumstances are favorable, to a decrease in the rate of natural discharge, or to a combination of these changes. When recharge once again balances discharge, the decline of the water levels due to pumping ceases, and the water levels once again become stable, except for fluctuations due to natural causes such as intermittent rainfall.

The ultimate drawdown in a well therefore is less where the conditions are favorable for the cone of depression to induce additional recharge to the aquifer, or where the conditions are favorable for the cone of depression to intercept natural discharge from the aquifer, or both.

Groundwater in Alachua County comes from two major sources: the Floridan Aquifer and the upper aquifers. The upper aquifers refer to those aquifers above the Floridan Aquifer and consist of a water table aquifer and other secondary artesian aquifers.

The water table aquifer is comprised of the sands of the Pleistocene terrace deposits and the sand and limestone layers near the top of the Hawthorn formation. This aquifer, however, is absent in a 300 square mile area in southwestern Alachua County. The water table aquifer is recharged by rainfall percolating downward to the water table, which is generally less than 10 feet below the surface. Water is discharged from the aquifer by evapotranspiration, to streams and lakes by downward seepage into lower aquifers, and through wells.

Secondary artesian aquifers occur principally in the limestone and sand layers in the lower part of the Hawthorn formation and in northeastern Alachua County in the Choctawhatchee formation. The potentiometric surfaces of these secondary artesian aquifers usually lie between the water table and the potentiometric surface of the Floridan Aquifer (Florida Geological Survey, Report of Investigations No. 35 1964a). Recharge to these aquifers is chiefly from the water table aquifer and discharge is principally to the Floridan Aquifer. The specific capacity of wells tapping these secondary artesian aquifers that have been tested ranges from 0.2 to 10 gpm per foot of drawdown.

Probably more wells tap these secondary artesian aquifers in this county than any other aquifer. In most places, however, neither the water table aquifer nor the minor artesian aquifers yield sufficient water for large supplies.

The Ocala group, the Lake City limestone, the Avon Park limestone, and possibly the lower portion of the Hawthorn formation comprise the Floridan Aquifer throughout the region. It is one of the most productive and extensive groundwater bearing formations in the United States, and easily transmits and stores more water than any other aquifer in north central Florida.

Plate 2-8 presents a potentiometric contour map of the county for the Floridan Aquifer. Groundwater generally flows at right angles to contour lines from higher to lower potentiometric contours.

In west and southwest Alachua County where there is no confining bed, the aquifer is under water table conditions. In the rest of the county the aquifer is under

artesian conditions. The aquifer is recharged by water leaking through the overlying confining bed, by percolating directly into the aquifer where no confining beds are present, and directly through sinkholes. Although the entire county is considered to be a recharge area, of special interest are notable areas of sinkhole recharge in the county, such as Hogtown Creek to Haile Sink, Sweetwater Branch and Paynes Prairie to Alachua Sink, and the unnamed sink in the southwestern part of Orange Lake. Another area of high recharge is the 300 square mile area in the southwestern portion of the county having no surface outflow.

Only part of the recharge is discharged in the county; most of the water moves out of the county in the direction of the hydraulic gradient. Some discharge takes place to lakes in the south and west portions of the area and additional discharge occurs to the Santa Fe River. Discharge also occurs through wells used for domestic and irrigation water resources and to flowing springs such as Poe Springs near High Springs which produces as much as 59 mgd. The specific capacity of wells into the Floridan Aquifer ranges from 2 to 700 gpm per foot of drawdown and pumping rates may range up to 5,000 gpm.

Artesian heads and water production vary throughout the aquifer because the more permeable zones are separated by beds of dense and nearly impermeable limestones and dolomites. In the Gainesville area permeable beds occur between 300 and 350 feet, 650 and 800 feet, and 960 to 1,020 feet. The city of Gainesville draws its water principally from these permeable upper beds between 300 and 350 feet.

TABLE 2-1

AVERAGE MONTHLY TEMPERATURE AND RAINFALL
FOR THE PERIOD 1931-1960
ALACHUA COUNTY

Month	Average Temperature (°F)	Average Rainfall (inches)
January	58.0	2.60
February	59.6	3.27
March	63.6	4.11
April	69.5	3.72
May	75.8	3.48
June	80.1	6.64
July	81.1	7.49
August	81.2	7.69
September	79.2	4.95
October	72.1	4.23
November	63.7	1.75
December	58.5	2.52

Source: Data from Comprehensive Area-Wide Plan for Water and Sewer Development, 1967a.

TABLE 2-2

SOILS OF ALACHUA COUNTY -- ACREAGE AND LOCATION

Soil	Acres in County	Approximate Location in County
Alachua loamy fine sand	4,036	Around Alachua, Bland, and Santa Fe
Alluvial soils, undifferentiated	7,200	Along Santa Fe in N and NW of county
Archer-Jonesville fine sands	4,271	Southwest - around Archer
Arredondo-Fellowship loamy fine sands	2,517	Western part of county
Arredondo loamy fine sand - fine sand	27,430	Broad belts between Micanopy and Bland
Bayboro loamy fine sand	15,544	Between Newnans Lake and Orange Lake
Bladen loamy sand	3,929	Near Island Grove, Levy, and Orange Lake
Blanton fine sand	20,649	Eastern part of county
Shallow phase	2,571	Eastern part of county
Chiefland fine sand	14,684	Western part of county
Fellowship gravelly loamy fine sand:		
Undulating phase	498	South of Alachua
Fellowship loamy fine sand:		
Rolling phase	6,036	Northwest and West Central parts of county
Undulating phase	8,969	SW, NW, and West Central parts of county
Fort Meade loamy fine sand	7,582	Around High Springs, Alachua, and Santa Fe
Gainesville-Arredondo loamy fine sands	13,910	Around High Springs and Alachua
Gainesville loamy fine sand:		
Rolling phase	2,572	Around Alachua
Undulating phase	4,981	Near Alachua
Hernando-Jonesville fine sands	41,989	SW and West Central part of county
Jamison loamy fine sand	3,553	SW part of county
Jonesville-Hernando fine sands	47,451	Western part of county
Kanapaha-Bladen complex	4,862	Southwestern part of county
Kanapaha fine sand	20,818	SW of county - small areas throughout W of county
Lakeland fine sand:		
Deep phase	9,360	SW of county
Undulating phase	60,240	Scattered - larger areas N and NW
Leon fine sand	93,193	LaCrosse, Waldo, and SE of county
Made land	1,290	In depressions and flats
Mines, pits, and dumps	903	Near Newberry
Orlando fine sand	23,807	Near Hawthorne, Lochloosa, Phifer, and Fairbanks
Peat	9,751	Marshes of Orange Lake and around Gainesville
Peaty muck	19,953	Eastern two-thirds of county, along streams, lakes

TABLE 2-2 – *Continued*

Soil	Acres in County	Approximate Location in County
Plummer fine sand	6,608	Depressed areas east of county
Rex loamy fine sand :	21,789	Around Waldo and Hawthorne
Shallow phase	4,370	Between Waldo and Hawthorne
Rutlege fine sand	25,404	Eastern part of county
Rutlege loamy fine sand: Shallow phase	2,954	Eastern half of county
St. Lucie fine sand	1,298	Northwestern part of county
Scranton loamy fine sand-fine sand	12,433	West Central and Northern part of county
Swamp	655	Low-lying areas, covered with water
Water and grass	17,170	3" to 3' of water - shallow ponds, parts of lake beds
Total Acreage	577,280	

Source: Data from Comprehensive Area-Wide Plan for Water and Sewer Development, 1967a.

TABLE 2-3

GEOLOGIC FORMATIONS PENETRATED BY WATER WELLS
ALACHUA COUNTY

Series	Formation		Estimated Thickness (feet) in Alachua County	Water Bearing Properties
Pleistocene and Recent	Surface soils and marine terrace deposits		5-50	Water table aquifer
Pliocene	Citronelle Formation-Unnamed coarse clastics	Alachua Formation	0-20	Water table aquifer
Miocene	Choctawhatchee Formation	Alachua Formation	0-30	Water table and secondary artesian aquifers
	Hawthorn Formation	Alachua Formation	0-200	
Oligocene	Suwannee Limestone		0-50	Floridan Aquifer
Eocene	Ocala Limestone		20-220	Floridan Aquifer
	Avon Park Limestone		up to 200	Principal source of public water supply
	Lake City Limestone		up to 450	

Source: Modified data from Pirkle, 1956b.

TABLE 2-4

LOCATION OF GAGING STATIONS, TYPES OF SURFACE WATER DATA COLLECTED, AND PERIODS OF RECORDS
ALACHUA COUNTY

Site No.	Name and Location	Drainage Area (sq. mi.)	Type and Period of Record
7	Camps Canal near Rochelle, Fla.	115	Periodic discharge, 1948-52; daily stage and discharge, 1957-60
9	Cross Creek near Island Grove, Fla.	--	Occasional discharge, 1942-47
12	Glen Springs near Gainesville, Fla.	--	Occasional discharge, 1942-60
16	Hatchet Creek near Gainesville, Fla.	57	Occasional discharge, peak stage, 1948-60
18	Hogtown Creek near Gainesville, Fla.	15.6	Occasional discharge, peak stage, 1958-60
25	Little Hatchet Creek near Gainesville, Fla.	10.9	Occasional discharge, 1947, 1956
26	Little Orange Creek near Orange Springs, Fla.	78.9	Periodic discharge, 1947-52; occasional discharge, 1956
28	Lochloosa Creek at Grove Park, Fla.	34.7	Occasional discharge, 1947, 1956; periodic discharge, 1957-60
29	Lochloosa Creek near Hawthorne, Fla.	43.3	Periodic discharge, 1947-52
30	Lochloosa Lake at Lochloosa, Fla.	*10.3	Stage, 1942-52, 1956-60

TABLE 2-4 – *Continued*

Site No.	Name and Location	Drainage Area (sq. mi.)	Type and Period of Record
31	Lochloosa Lake Outlet near Lochloosa, Fla.	--	Daily stage and discharge, 1946-55
32	Magnesia Springs near Hawthorne, Fla.	--	Occasional discharge, 1941-60
35	Newnans Lake near Gainesville, Fla.	8.2	Stage, 1945-52, 1957-60
43	Orange Creek at Orange Springs, Fla.	431	Daily stage and discharge, 1942-52, 1955-60
44	Orange Lake at Orange Lake Fla.	*25.7	Stage, 1945-60
45	Orange Lake Outlet near Citra, Fla.	--	Daily stage and discharge, 1946-55
48	Poe Springs near High Springs, Fla.	--	Occasional discharge, 1929-60
49	Prairie Creek at State Road 20 near Gainesville, Fla.	111	Occasional discharge, 1947-1948, 1956
50	River Styx near Micanopy, Fla.	--	Occasional discharge, 1956-58
55	Santa Fe River near Graham, Fla.	135	Daily stage and discharge, 1957-60
56	Santa Fe River near High Springs, Fla.	950	Daily stage and discharge, 1931-60

Source: Clark *et al.*, No. 35, 1964 and Clark *et al.*, No. 43, 1964.

*Area of lake surface.

19-73-50

TABLE 2-5

LAKES IN ALACHUA COUNTY

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
		St. Johns			
Alice, Lake	73		68	1	S12 T10S R19E
Bivens Arm	189	4.6	63	3	S2 T10S R20E
Blue Pete Lake	153		53	4	S28 T11S R18E
Calf Pond	14		78	4	S14 T10S R20E
Chacala Pond	129		62	2	S9 T11S R20E
Clear Lake	10		59	4	S3 T10S R19E
Devils Mill Hopper	5		173	4	S15 T9S R19E
Elizabeth, Lake	115		128	2	S22 T9S R22E
Fish Pond	102		63	4	S19 T11S R21E
Fish Prairie	194		63	4	S29 T11S R21E
Georges Pond	57		69	4	S8 T11S R20E
Grass Prairie	33		58	4	S21 T11S R19E
Hay Lake	90		63	4	S11 T11S R21E
Hog Pond	29		63	4	S25 T11S R20E
Hogtown Prairie	178		57	4	S10 T10S R19E
Holdens Pond	80		88	3	S1 T11S R22E
Jeffords, Lake	162		82	3	S10 T11S R22E
Johnson, Lake	52		138	2	S26 T10S R22E
Kanapaha Prairie Lake	268		49	3	S9 T11S R19E
Kanapaha, Lake	201		57	4	S15 T10S R19E

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TABLE 2-5 — *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
Ledwith Lake	1,785		66	3	S31 T11S R20E
Levy Lake	4,556		63	3	S24 T11S R19E
Little Lochloosa Lake	2,642		58	3	T12S R21E
Little Orange Lake	818		88	3	S36 T10S R22E
Lochloosa Lake	5,705	1,100.0	58	3	S20 T11S R22E
Lowman Pond	196		63	1	S11 T11S R21E
Marans Prairie	251		113	3	S28 T9S R22E
Newnan, Lake	7,427	111.0	68	3	S4 T10S R12E
Orange Creek Camp Lake	421		99	3	S11 T10S R22E
Orange Lake	12,706	110.0		3	T12S R21E
Palatka Pond	12		74	4	S9 T11S R21E
Paynes Prairie Lake	4,292		56	3	S28 T10S R20E
Perch Lake	1		76	4	S14 T10S R20E
Perry Pond	20		61	4	S6 T11S R21E
River Styx	576		58	3	S12 T11S R21E
Saluda Swamp	326		148	4	S5 T9S R22E
Sam Joe Pond	11		77	2	S26 T11S R22E
Sawgrass Pond	94		67	3	S9 T11S R20E
Stafford Pond	31		73	4	S10 T11S R20E
Stanley Prairie	359		97	3	S14 T10S R22E

TABLE 2-5 — *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
Tillmans Pond	39		73	4	S6 T11S R21E
Tuscawilla Lake	680		83	4	S36 T11S R20E
Unnamed Lake	27		63	4	SE¼ S9 T11S R20E
Unnamed Lake	14		66	4	S5 T11S R21E
Unnamed Lake	157		70	3	NE¼ S22 T11S R22E
Unnamed Lake	25		70	4	SW¼ S23 T11S R22E
Unnamed Lake	28		71	4	NE¼ S27 T11S R22E
Unnamed Lake	95		95	3	NW¼ S25 T10S R22E
Unnamed Lake	17		57	4	SE¼ S29 T11S R18E
Unnamed Lake	19		83	4	SE¼ S13 T10S R20E
Unnamed Lake	73		87	4	SE¼ S1 T10S R21E
Unnamed Lake	15		107	2	NW¼ S8 T10S R22E
Unnamed Lake	53		90	3	SW¼ S8 T10S R22E
Unnamed Lake 1	19		58	4	NE¼ S21 T11S R19E
Unnamed Lake 2	31		59	4	NE¼ S21 T11S R19E
Unnamed Lake	321		62	2	SE¼ S25 T10S R20E
Unnamed Lake	40		58	4	SW¼ S16 T11S R19E
Unnamed Lake	31		57	4	SE¼ S16 T11S R19E
Unnamed Lake	29		77	4	NW¼ S6 T10S R19E
Unnamed Lake	24		98	4	SE¼ S26 T9S R21E

TABLE 2-5 – *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
Unnamed Lake	25		112	1	NW¼ S24 T9S R21E
Unnamed Lake	397		101	1	SE¼ S30 T9S R21E
Unnamed Lake	19		128	4	NE¼ S18 T9S R22E
Unnamed Lake	48		128	4	SE¼ S18 T9S R22E
Unnamed Lake	31		78	4	NE¼ S14 T10S R20E
Unnamed Lake	92		120	1	NE¼ S4 T10S R22E
Unnamed Lake	10		118	2	NE¼ S9 T10S R22E
Unnamed Lake	109		107	3	NW¼ S9 T10S R22E
Unnamed Lake	15		121	4	SW¼ S3 T10S R22E
Unnamed Lake	13		104	3	NE¼ S10 T10S R22E
Unnamed Lake	20		118	3	SW¼ S1 T10S R22E
Unnamed Lake	22		107	2	SE¼ S29 T9S R22E
Unnamed Lake	160		115	1	SW¼ S27 T9S R22E
Unnamed Lake	11		118	1	NW¼ S34 T9S R22E
Unnamed Lake	11		163	3	SW¼ S26 T9S R22E
Unnamed Lake	12		133	3	SE¼ S22 T9S R22E
Unnamed Lake	12		144	1	SE¼ S23 T9S R22E
Unnamed Lake	12		130	1	SE¼ S24 T9S R22E
Unnamed Lake	12		159	2	NE¼ S8 T9S R22E
Unnamed Lake	12		159	3	SE¼ S8 T9S R22E

TABLE 2-5 — *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
Unnamed Lake	16		158	4	NW¼ S9 T9S R22E
Unnamed Lake	14		153	4	SW¼ S9 T9S R22E
Unnamed Lake	25		60	4	NE¼ S5 T11S R21E
Unnamed Lake	31		60	4	SW¼ S6 T11S R21E
Unnamed Lake	10		63	4	SE¼ S12 T11S R21E
Unnamed Lake	10		64	3	NE¼ S21 T11S R21E
Unnamed Lake	13		64	2	SW¼ S15 T11S R21E
Unnamed Lake	14		72	4	SE¼ S29 T10S R21E
Unnamed Lake	10		74	4	SE¼ S28 T10S R21E
Unnamed Lake 2	52		98	4	NE¼ S26 T10S R21E
Unnamed Lake 1	48		98	4	NE¼ S26 T10S R21E
Unnamed Lake	18		73	4	SE¼ S20 T10S R21E
Unnamed Lake	271		83	3	SW¼ S13 T11S R22E
Unnamed Lake	11		103	3	NE¼ S3 T11S R22E
Unnamed Lake	27		141	2	SE¼ S21 T10S R22E
Unnamed Lake	13		58	4	SW¼ S3 T10S R19E
Unnamed Lake	12		173	4	SW¼ S22 T9S R19E
Unnamed Lake	31			4	NW¼ S35 T11S R19E
Unnamed Lake	37			4	SW¼ S20 T11S R18E
Unnamed Lake	60			4	NW¼ S29 T11S R18E

TABLE 2-5 — *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
Unnamed Lake	42			4	SE¼ S29 T11S R18E
Unnamed Lake	18			4	NE¼ S5 T12S R18E
Unnamed Lake	24			4	SW¼ S34 T11S R20E
Unnamed Lake	35			4	NW¼ S35 T11S R20E
Unnamed Lake	12			4	NW¼ S11 T11S R17E
Unnamed Lake	23			4	NE¼ S11 T11S R17E
Unnamed Lake	24			4	NE¼ S1 T11S R17E
Unnamed Lake	21			4	SW¼ S12 T11S R17E
Unnamed Lake	26			4	NW¼ S25 T11S R17E
Unnamed Lake	22			4	NE¼ S11 T11S R17E
Unnamed Lake	96			4	NW¼ S32 T11S R19E
Unnamed Lake	24		78	2	SW¼ S25 T11S R22E
Unnamed Lake	17		78	4	SE¼ S25 T11S R22E
Unnamed Lake	22		83	2	SW¼ S14 T11S R22E
Unnamed Lake	29		96	4	SE¼ S23 T10S R22E
Unnamed Lake	13		67	2	S22 T11S R21E
Unnamed Lake	11		143	4	S27 T9S R19E
Watson Prairie	381		67	1	S13 T11S R21E
Wauberg Lake	248		67	4	S9 T11S R20E

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TABLE 2-5 — *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
		Suwannee — St. Marys			
Altho, Lake	540		147	3	S19 T8S R22E
Burnetts Lake	23		64	1	S13 T8S R18E
Fox Pond	7		138	2	S16 T9S R19E
Hickory Pond	66		155	4	S20 T8S R18E
Hogpen Pond	2		38	4	S1 T7S R17E
Mud Swamp	270		83	3	S19 T7S R20E
Ogden Pond	1		38	4	S1 T7S R17E
Prairie Lake	33		115	4	S44 T8S R19E
Sanchez Prairie Lake	272		83	4	S37 T8S R19E
Sunshine Lake	213		81	1	S31 T7S R20E
Sweet Water Lake	3		35	4	S14 T7S R17E
Trout Pond	44		113	4	S33 T7S R20E
Unnamed Lake	38		135	4	T9S R22E
Unnamed Lake	46		142	1	T9S R22E
Unnamed Lake	12		83	1	NW¼ S37 T8S R19E
Unnamed Lake	16		178	2	SW¼ S23 T8S R19E
Unnamed Lake	10		143	4	SE¼ S20 T8S R19E
Unnamed Lake	11		163	4	NE¼ S23 T8S R18E
Unnamed Lake	12		137	2	NW¼ S11 T8S R18E
Unnamed Lake	14		157	4	SW¼ S33 T7S R19E

TABLE 2-5 — *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
Unnamed Lake	22		105	4	NE¼ S21 T7S R19E
Unnamed Lake	12		83	3	NE¼ S7 T8S R19E
Unnamed Lake	12		192	4	SE¼ S7 T9S R19E
Unnamed Lake	31		142	2	NW¼ S23 T9S R22E
Unnamed Lake 2	22		172	4	NW¼ S28 T8S R20E
Unnamed Lake 1	23		173	1	NW¼ S28 T8S R20E
Unnamed Lake	24		168	4	NE¼ S28 T8S R20E
Unnamed Lake	44		164	4	NW¼ S27 T8S R20E
Unnamed Lake	30		164	4	SW¼ S23 T8S R20E
Unnamed Lake	78		164	4	NE¼ S26 T8S R20E
Unnamed Lake	26		167	4	SE¼ S26 T8S R20E
Unnamed Lake	38		157	4	SE¼ S11 T8S R20E
Unnamed Lake	19		164	4	SW¼ S14 T8S R20E
Unnamed Lake	125		163	4	SE¼ S14 T8S R20E
Unnamed Lake	11		38	4	SW¼ S31 T7S R20E
Unnamed Lake	116		116	3	SE¼ S5 T8S R20E
Unnamed Lake	19		143	3	SE¼ S18 T8S R20E
Unnamed Lake	33		118	3	SW¼ S33 T7S R20E
Unnamed Lake	29		119	2	NW¼ S4 T8S R20E
Unnamed Lake	16		102	3	SE¼ S4 T8S R20E

TABLE 2-5 – *Continued*

Name of Lake	Surface Area (acres)	Drainage Area (sq. mi.)	Elev. (ft. msl)	Type of Lake	Location
Unnamed Lake	56		106	2	SW¼ S3 T8S R20E
Unnamed Lake	27		158	4	SW¼ S1 T8S R20E
Unnamed Lake	10		158	4	SW¼ S11 T8S R20E
Unnamed Lake	12		123	3	NW¼ S9 T8S R20E
Unnamed Lake	11		127	2	NW¼ S5 T8S R20E
Unnamed Lake	61		188	4	SE¼ S1 T9S R19E

Source: Florida Lakes, Part III, Gazeteer, 1969.

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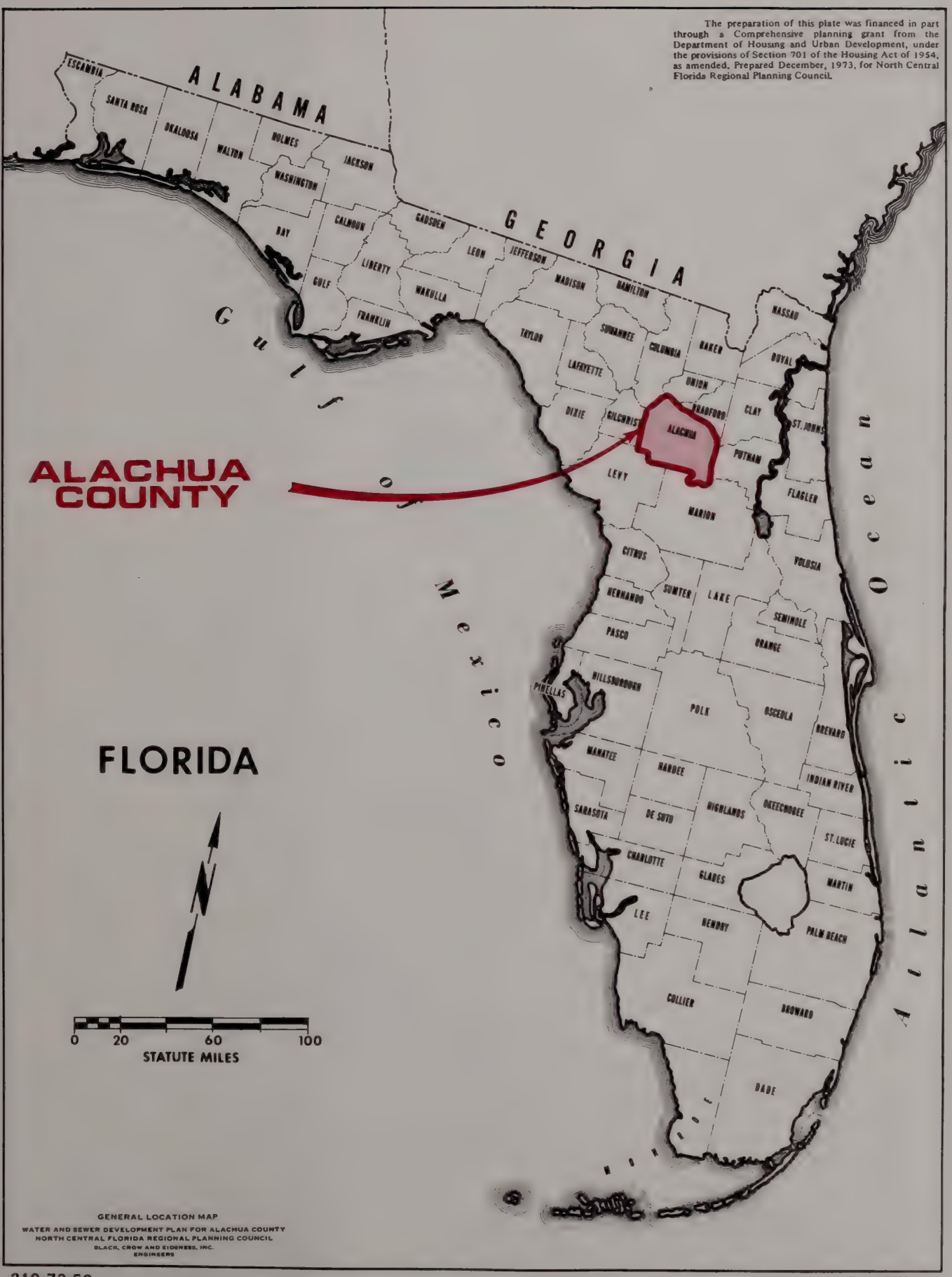

GENERAL LOCATION MAP
WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
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ENGINEERS

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PLANNING AREA – ALACHUA COUNTY

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
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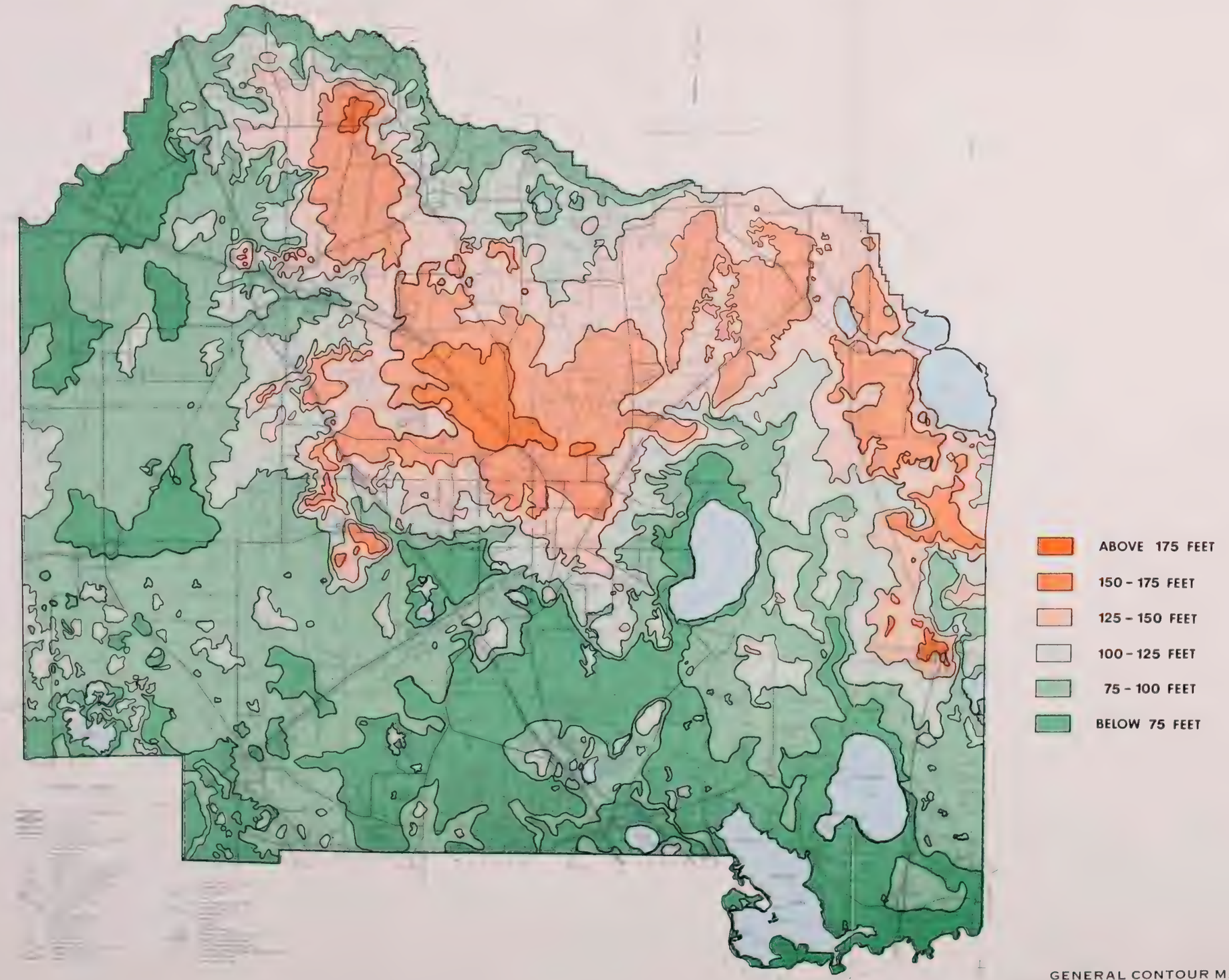

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GENERAL CONTOUR MAP
WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
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NOTE:

The areas shown as the outcrop of the Ocala Group, Hawthorn Formation, Alachua Formation, and the unnamed coarse clastics are covered by a veneer of sediments that are mostly loose sands and are, for the most part, older Pleistocene terrace deposits. Materials that are Pleistocene and recent deposits blanket the outcrop of the Choctawhatchee formation. The cover of sediments range in thickness from 0 to 15 feet. Dashed line indicates inferred position of formational boundaries. Modified from maps by Vernon 1951 and Puri and Vernon 1959. Both after Cook 1945

WELL FOR WHICH DRILL CUTTINGS ARE AVAILABLE

WELL FOR WHICH DRILLERS LOG IS AVAILABLE

—40—

CONTOUR REPRESENTS THE ELEVATION OF THE TOP OF THE OCALA GROUP, IN FEET REFERRED TO MEAN SEA LEVEL. CONTOUR INTERVAL 40 FEET.

A — A'

LINE OF GEOLOGIC SECTION

OLDER PLEISTOCENE TERRACE DEPOSITS

ALACHUA FORMATION

HAWTHORN FORMATION

OCALA GROUP

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GENERAL GEOLOGIC MAP

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

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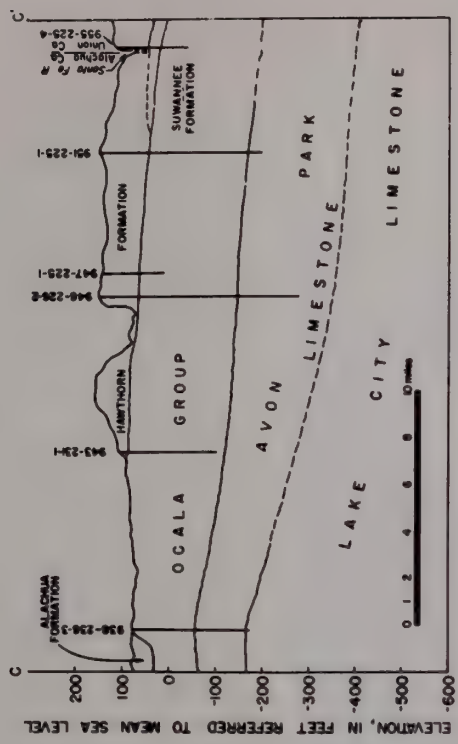
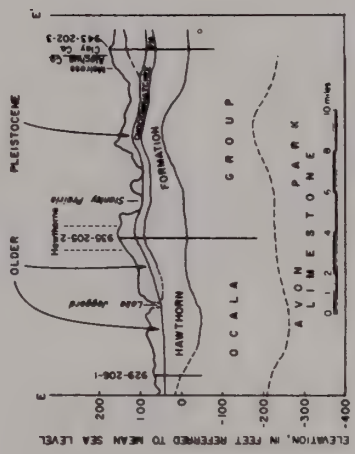
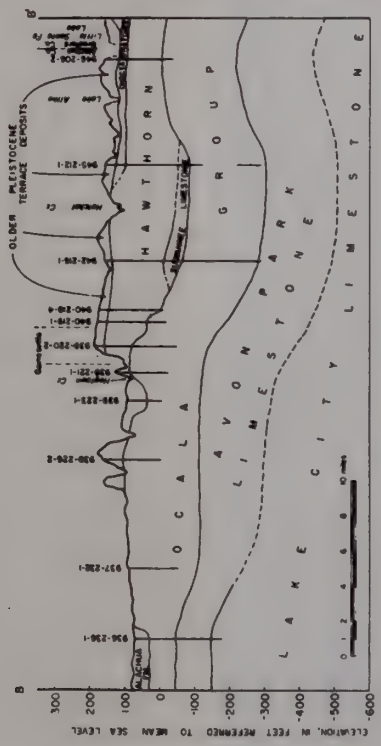


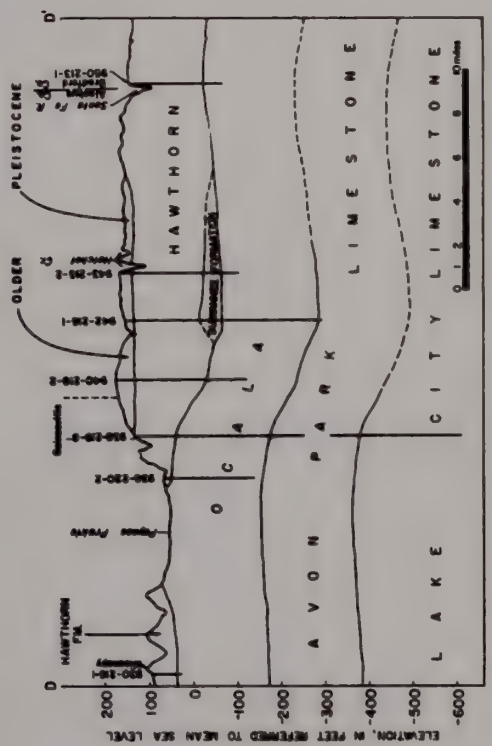
Southwest-northeast geologic section in Alachua County along line C-C' on Plate 2-5.



South-north geologic section in Alachua County along line E-E' on Plate 2-5.



West-east geologic section in Alachua County along line B-B' on Plate 2-5.



South-north geologic section in Alachua County along line D-D' on Plate 2-5.

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GEOLOGICAL CROSS SECTIONS

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
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AREAS DOMINATED BY SLOPING SOILS WITH GROUND WATER BELOW 60 INCHES

WITH SANDY SURFACE LAYERS MORE THAN 40 INCHES THICK

1 Kershaw Basinger Association Broad sandy ridges of strongly acid yellowish sands interspersed with a few small wet areas and lakes

2 Jonesville Hernando Association Broad sandy ridges of slightly acid yellowish sand interspersed with many small areas of similar soils which have fine textured subsoils less than 30 inches deep

3 Arredondo Zuber Association Broad low hills of slightly or medium acid brownish phosphatic sands interspersed with small areas of similar soils which have fine textured subsoils less than 30 inches deep

WITH SANDY SURFACE LAYERS LESS THAN 40 INCHES THICK

4 Kendrick Hague Association Broad low hills of slightly to medium acid brownish phosphatic sandy soils interspersed with small areas of similar soils which are more than 40 inches deep to fine textured subsoils

5 Hernando Jonesville Association Broad sandy ridges of slightly acid yellowish sands interspersed with small areas of similar soils which are more than 40 inches deep to fine textured subsoils

AREAS DOMINATED BY NEARLY LEVEL SOILS WITH GROUND WATER TABLE THAT NORMALLY FLUCTUATES 30 TO 60 INCHES BELOW THE SURFACE

WITH SANDY SURFACE LAYERS MORE THAN 40 INCHES THICK

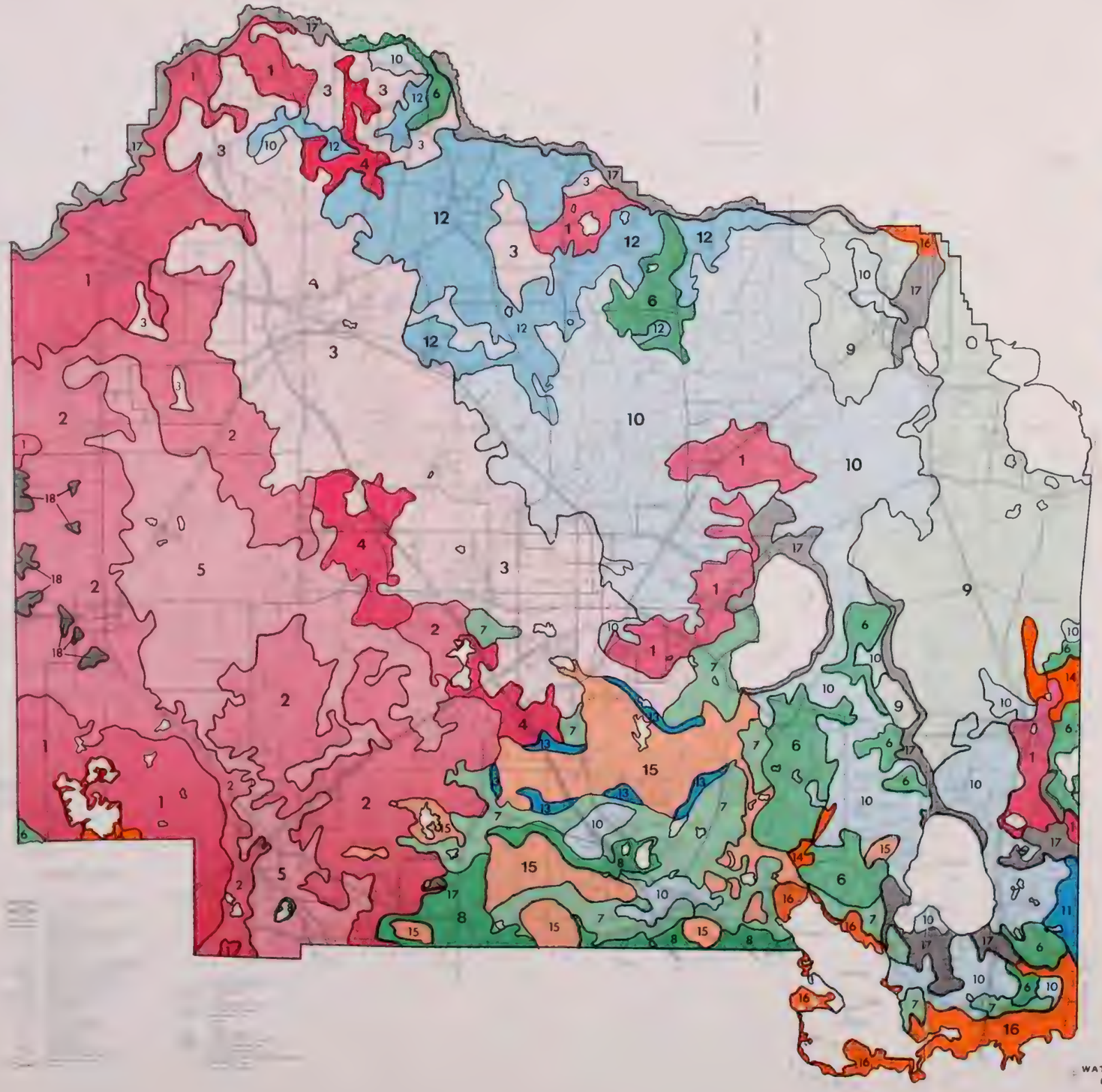
6 Tavares Myakka Basinger Association Broad low sand ridges of strongly acid gray sands interspersed with small areas of more poorly drained very strongly acid gray sands that have an organic stained pan below the surface soil and small swamps

7 Kanapaha Blichton Association Broad low sand ridges of medium acid gray phosphatic sands interspersed with similar soils that have a fine textured subsoil less than 40 inches deep

WITH SANDY SURFACE LAYERS LESS THAN 40 INCHES THICK

8 Blichton Lochloosa Flemington Association Broad low ridges of gray sandy soils which have mottled slowly permeable strongly acid phosphatic loamy subsoils interspersed with small areas of similar soils with clayey subsoils and other areas with sandy surface layers more than 40 inches thick

9 Rex Pelham Mascotte Association Broad low ridges of gray sandy soils which have mottled slowly permeable strongly acid clayey subsoils interspersed with similar soils that have loamy subsoils and more poorly drained sandy soils that have an organic stained pan between the surface and the clayey subsoil



AREAS DOMINATED BY NEARLY LEVEL SOILS WITH GROUND WATER TABLE THAT NORMALLY FLUCTUATES 0 TO 30 INCHES BELOW THE SURFACE

WITH SANDY SURFACE LAYERS MORE THAN 40 INCHES THICK

10 Myakka Basinger Association Broad sandy lowlands with very strongly acid gray sands that have a brown organic stained pan within 42 inches of the surface interspersed with depressions which have very strongly acid very poorly drained deep sands

11 Myakka Tavares Basinger Association Broad sandy lowlands with very strong acid gray sands that have a brown organic stained pan within 42 inches of the surface interspersed with low ridges and knolls of better drained strongly acid deep gray sands and depressions which have very strongly acid very poorly drained deep sands

12 Scranton Basinger Myakka Association Broad sandy lowlands with very strongly acid sands that have thick black surface soils interspersed with depressions which have very strongly acid very poorly drained deep sands and small areas with gray surface soils and an organic stained pan within 42 inches of the surface

WITH SANDY SURFACE LAYERS LESS THAN 40 INCHES THICK

13 Bladen Grayville Association Broad wet lowlands with soils that have thin gray surface soils and highly mottled very strongly acid clayey subsoils interspersed with small areas of more poorly drained soils that have black surface soils and very strongly acid mottled clayey subsoils

AREAS DOMINATED BY NEARLY LEVEL SOILS WITH GROUND WATER TABLE THAT NORMALLY IS WITHIN 15 INCHES OF THE SURFACE AND FREQUENTLY RISES ABOVE THE SURFACE

WITH SANDY SURFACE LAYERS MORE THAN 40 INCHES THICK

14 Ruttege Brighton Association Low wet flatlands with soils that have thick black sandy surface layers and very strongly acid sandy subsurface layers interspersed with shallow ponds and small wet areas that have several inches of organic surface layers over the sandy layers

WITH SANDY SURFACE LAYERS LESS THAN 40 INCHES THICK

15 Bayboro Placid Association Low wet flatlands with soils that have gray sandy surface soils and very strongly acid mottled loamy or clayey subsoils interspersed with small areas that are very poorly drained deep sands with thick black surface layers

WITH THICK ORGANIC SURFACE LAYERS

16 Everglades Brighton Association Low level marshlands that have deep organic soils

MISCELLANEOUS AREAS

17 Fresh Water Swamp Low wet swampy areas subject to frequent or prolonged flooding

18 Mines Pits and Dumps Large areas of mined land where original soils have been removed in mining operations

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GENERAL SOIL MAP

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
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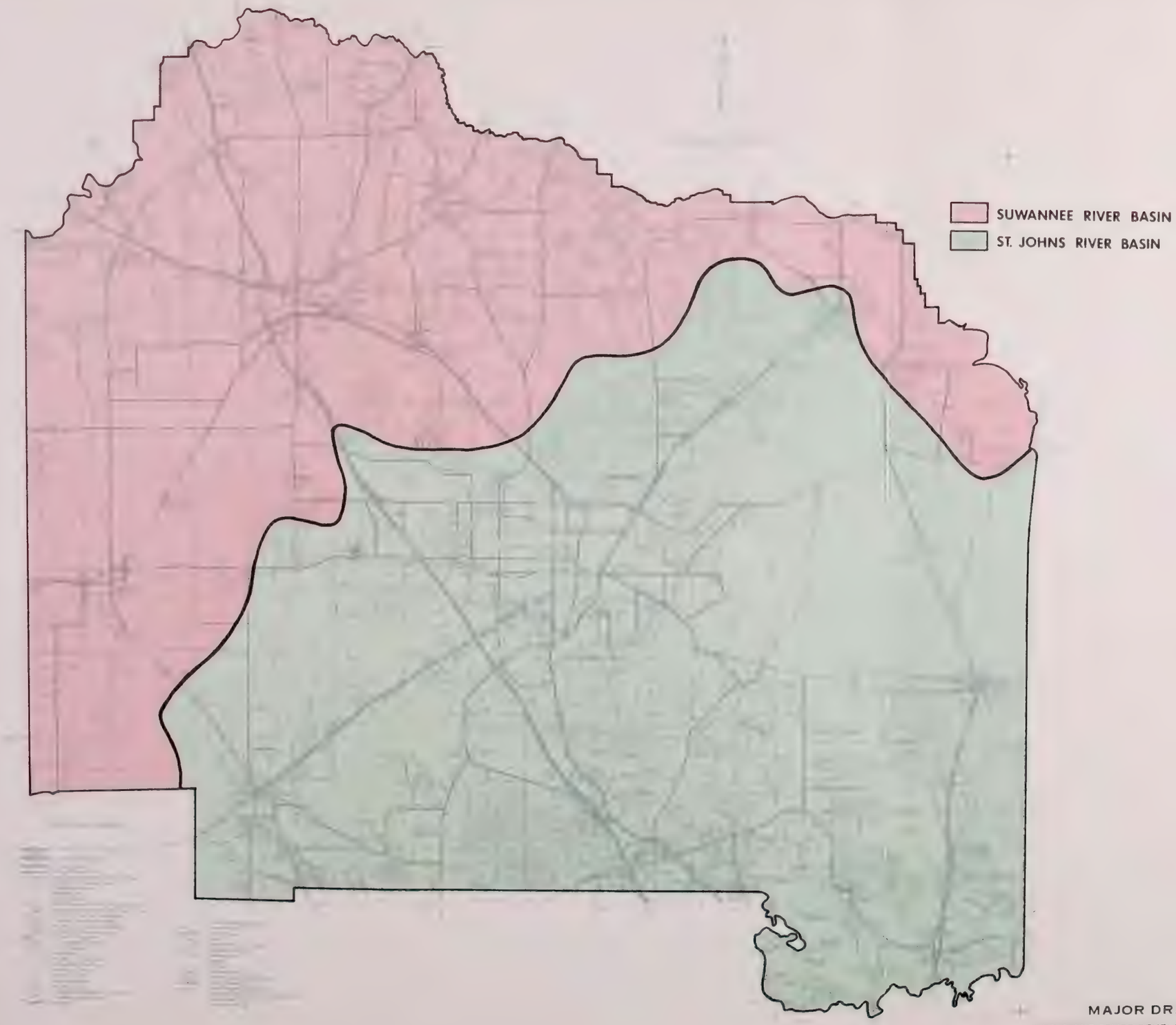

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MAJOR DRAINAGE BASINS

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

BLACK, CROW AND EIDSNESS, INC
ENGINEERS

SECTION 3

LAND USE DEVELOPMENT

3.1 LAND PATTERNS AND TRENDS

As a result of the increase in population and its changing characteristics, the way in which land is used in the region has changed. The primary land use in Alachua County during the early 1900s was agricultural. In 1973, however, there are two basic land use patterns found within the county. Agricultural land use has retained its dominance and is still the primary land use category. Development of a major urban center at the approximate geographic center of the county has occurred. Thus, the Gainesville urban area has developed into a second major land use group. The land use patterns of the urban center are primarily residential and institutional in nature. Commerical land uses, although occupying a relatively smaller number of acres, have developed to support the agricultural, residential, and institutional uses. Table 3-1 summarizes the major land use categories for Alachua County in 1972 and Plate 3-1 illustrates the existing land use within the county in map form.

3.2 URBAN GROWTH

With the city of Gainesville being the major growth center, land use patterns and the intensity of development have evolved to a higher degree than those found in the eight smaller communities within the county. The smaller towns of Alachua, Archer, Hawthorne, High Springs, LaCrosse, Micanopy, Newberry, and Waldo have retained their rural character and, as such, exhibit land use patterns synonymous with agricultural productivity. Gainesville, on the other hand, has developed land use patterns characteristic of an urban center.

The major growth within the urban area in recent years has taken place in the north and northwestern sectors of the community. The northwestern sector has been developed to a greater degree because of the desirability of soil and topographic features that exist in the area, as well as the existence of natural boundaries to the south and east and property owned by industry to the north.

3.3 RESIDENTIAL DEVELOPMENT

The general growth pattern for residential areas around Gainesville has been a sprawling type with a great deal of "leap frog" subdivision development. This type of

growth consumes huge land areas and increases the cost of providing public services and facilities.

In some instances land has developed prematurely creating platted subdivisions scattered with only a few dwellings. This tends to degrade the total residential character of these areas and consequently the community. Table 3-2 shows the existing land use within the Gainesville urban area.

Population densities in Alachua County except the Gainesville urban area are very low. The density of residential development within the urban area ranges from 15 units per acre to one unit per acre. Residential development within the urban area for many years consisted primarily of singlefamily dwelling units with multiplefamily construction being supplied only to satisfy the demand generated by the University of Florida. Today though, the singlefamily market has continued to expand at a normal growth level while the number of multifamily units has increased at an above-average rate. In 1971, some 2,800 multifamily units were constructed as compared to approximately 105 units in 1970. Estimates are that the 1972 multifamily construction continued to greatly exceed the 1970s rate.

With Gainesville the home of the University of Florida, institutional land use development ranks second to residential land use in the urban area. In addition to the University of Florida, there is Santa Fe Community College and a state vocational school, Sunland Training Center, utilizing large land areas. Medical facilities associated with the University, the Veterans Administration Hospital, Alachua General Hospital, and the privately owned North Florida Regional Hospital also utilize some major urban land areas.

3.3.1 Regional Development Goals

The North Central Florida Regional Planning Council, in conjunction with their Citizen Participation Committee, has formulated the following goals to guide the planning activities of the Council:

1. The enhancement of the total environment in pursuit of the optimum quality of life for residents of the North Central Florida region.

2. The direction of growth toward an orderly, economically, and aesthetically pleasing region.

3. The provision of adequate housing for all citizens.

4. The conservation and improvement of quality of air, water, and earth resources.

5. The development of an accessible, economical, and safe transportation system.

6. The improvement and augmentation of the provision of community facilities and public services for all citizens.

In addition, objectives were defined which include the encouragement of the installation of coordinated and unified water and sewer systems to serve areas of existing and potential development; to assist in the development of plans to preserve adequate open space and natural resources; to continue efforts for the conservation and improvement of the quality of air, water, and earth resources; and to continue to assist governmental bodies to acquire financial assistance to implement plans.

With these goals and objectives in mind, the following basic concepts of development were examined:

1. *Corridor Development*—growth occurs along the major roadways. As a result, the ability of the highways to carry traffic is increasingly limited. Provision of utilities and services is expensive and inefficient. Corridor development is shown on Plate 3-2.

2. *Spot Development*—small pockets of growth occur throughout the area. Efficient utility services and adequate community facilities are impossible. Transportation is inefficient and expensive. Spot development is shown on Plate 3-3.

3. *Compact Development*—existing cities act as growth centers with new development either as a fill-in for undeveloped areas or new growth adjacent to existing development. In addition, totally planned new towns of sufficient size to warrant a full complement of facilities supplement existing growth centers. Compact development permits maximum use of all facilities and continues to create a sound basis upon which anticipated future expansion may be built. This form of development is shown on Plate 3-4.

The preliminary land use plan as published by the North Central Florida Regional Planning Council cites the relative advantages of compact development over spot and corridor developments. This form of growth provides access to services necessary for the best urban environment. At the same time, sufficient land is reserved for open spaces and agriculture. These kinds of advantages can readily be provided within current governmental structures.

Accomplishment of the compact form of development requires an integrated effort of all planning activities. In addition, public policy must be brought into play. With

carefully prepared plans for water and sewer expansion and adequate public policy, much control over the area of development may be executed. Open space acquisition and public recreational development can be used to give form and relief to the compact development. Consistent regulatory devices for all governmental entities in the area will assist in insuring that development will occur without regard for jurisdictional boundaries.

3.4 AGRICULTURAL LAND USE

Land use patterns of the county have been influenced to a great degree by the large tracts of commercial forestry present within the county. Commercial forestry has been classified as an agricultural land use. As evidenced from the existing land use map (Plate 3-1), the major concentrations of commercial forestry are located in the northeast and southeast portions of the county. In many instances, these large tracts of commercial forestry have deterred development in these directions. The tracts do, however, provide a buffer for the urban area in the northeastern and eastern sections of the county. Strip development and spot development are also hindered by these major holdings.

Situated to the south of the Gainesville urban area and in the southern sector of the county are approximately 18,000 acres of state owned property. The property, as shown on Plate 3-5, not only has historical significance but also ecological value. The tract, known as Paynes Prairie, has been acquired by the State of Florida so that it can be preserved. This large holding also acts as a deterrent to land use development in the southern portion of the county. The commercial forestry and the prairie have, therefore, precluded land use development in the Gainesville urban area to the east and south. Table 3-3 presents a general representation of approximate agricultural land use capabilities by class and acreage in Alachua County.

3.5 RECREATIONAL LAND USE

The demand for outdoor recreation and open space has been a major concern in the past decade. It promises to have a greater influence on future private and governmental activities and policies. Increasing population, the four-day work week, longer holiday periods, and higher income levels will continue the unparalleled demand for outdoor facilities and organized open spaces.

Our land and water resources are limited in spite of the fact that open land exists within and beyond populated areas. Accessible open land is rapidly disappearing and very difficult to acquire, especially where the need is the greatest—where the people live and work. As development often centers around recreational sites creating areas having a critical need for sanitary facilities, information on open space and recreational centers is useful background information for a water and sewer facilities study.

This section contains a summary of all major recreation and open space areas in Alachua County. Detailed information on this topic may be found in the report on Open Space and Recreation, 1973, completed for Alachua County by the North Central Florida Regional Planning Council.

3.5.1 State Parks in Alachua County

Paynes Prairie

Located to the south of Gainesville and the north of Micanopy, Paynes Prairie covers over 17,000 acres. The property is now under the control of the Division of Recreation and Parks of the Department of Natural Resources.

Following completion of a three-year study of the prairie in June, 1974, the area will be developed into a multi-purpose recreational facility. It will attempt to combine preservation of a unique wildlife habitat with a wide variety of compatible public recreational activities.

Devils Millhopper

The Devils Millhopper is considered to be one of the largest and oldest sinks in the state. This 39-acre site located in northwest Gainesville has recently changed guardianship from the University of Florida to State Department of Natural Resources. There are tentative plans to acquire more property west of the sink and when completed, the park will allow public use and study of this unique natural phenomenon.

O'Leno State Park

O'Leno State Park is located in the northwest corner of Alachua County, north of High Springs. This is a very well developed state park on 169 acres. The park is located on the Santa Fe River at the point where it goes underground for approximately five miles.

Camp Wauberg

Camp Wauberg sits on a 14-acre tract of land on the northern edge of Lake Wauberg near Micanopy. It is bordered on the north and east by state property controlled by the Department of Natural Resources and on the west by private landowners. The camp property is under ownership of the State Board of Regents and controlled by the University of Florida. The camp was closed to use in 1970 and has never been reopened. Current plans are to open this area in July, 1974.

County-Owned Recreational Areas

For the purpose of brevity, information on all county owned recreation areas is summarized in Table 3-4 and each site located on the accompanying Plates 3-6 and 3-7. For the most part, these park sites have not been developed with the exception of the construction of boat ramps. Therefore, their classification is based on their potential according to size rather than current purpose. The following definitions will aid in distinguishing between the various types of parks referred to on Table 3-4.

Special Use Facilities

Special use facilities are recreation areas designed to serve one primary function, such as a football stadium or swimming pool. These facilities are normally located on sites which provide only enough space for the single use.

Neighborhood Parks

Neighborhood parks serve the recreation needs of persons of all ages in the neighborhoods. They are intended to enhance the neighborhood setting and appearance and may include the playgrounds of elementary schools provided the areas are contiguous. Usually, the neighborhood parks are partly wooded and partly open and designed to serve both the active and passive recreation needs of all family members.

District Parks

District parks are areas designed to serve groups of neighborhoods. They are large enough to accommodate a variety of recreation facilities for all age groups. Available facilities may include athletic fields, courts for various sports, a swimming pool, areas of natural beauty, and family picnic areas.

Regional Parks

Regional parks are recreation areas which are capable of serving all the people in the region. These parks provide major recreation facilities not duplicated in district parks such as sports centers, golf courses, bridle paths, and lakes or streams for fishing and boating. They also have other facilities found in community parks such as athletic fields, game courts, family picnic facilities, playground equipment for young children, nature trails, and a recreation building for organized social and recreational activities. Regional parks may also serve as large open space areas which provide for a relief in urban development.

It is important to note that the county owns no parks which, by size, can be classified as regional. This is significant because the county is the most likely provider of

regional park facilities. Currently there is only one regional park in Alachua County, Morningside Park, which is owned by the city of Gainesville. Morningside Park meets this definition in size by comprising some 278 acres and having a variety of activities and facilities available.

3.5.2 Gainesville Urban Area

Neighborhood Parks

There are 10 parks in the Gainesville urban area which fall within the neighborhood park category. Table 3-5 provides a listing of areas designated as neighborhood parks, with the characteristics of each shown.

District Parks

There are currently four parks in the Gainesville urban area which are classified as district parks. These parks and their salient characteristics are shown in Table 3-6. Plate 3-7 illustrates the location of neighborhood and district parks in the Gainesville urban area.

3.5.3 Timber and Wildlife Management Areas

Timber and wildlife management areas are of interest because of the vast amount of open space to which the public has access. In Alachua County alone, there are several thousands of acres owned by various pulp and paper manufacturers. These different corporations open certain portions of their land to the public. Making this land accessible to the public is a result of both a genuine concern for the recreation interests of the people and efforts to enhance the public image of the corporation.

As a result of the land being well managed, wildlife has flourished, drawing the interest of many hunters and developing a concern among company officials for wildlife control methods. While hunting remains the dominant recreation use of most management land, increasing numbers of people are finding these forest lands ideal for hiking, bird watching, nature study, picnicking, and camping. To hunt on these lands will normally require a management area stamp or a recreation permit. Users are asked to observe rules pertaining to the different sites that will preserve the areas for use by others.

Of the three large landholders in Alachua County, Owens-Illinois has the most property, approximately 40,000 acres. Container Corporation is next with around 20,000 and Hudson Pulp and Paper Company holds approximately 10,000 acres. Information on the location, regulations, and activities at the different management areas can be obtained by contacting the offices of the respective companies in Alachua County.

One tract of land belonging to the University of Florida and managed by the Forest Resources and Conservation School is the Austin Cary Memorial Forest which contains over 1,000 acres of timberland. There are no developed recreation facilities other than a nature trail. The forest is open to the public every day. These areas are shown in Plate 3-8.

TABLE 3-1

LAND USES IN ALACHUA COUNTY

	Thousand Acres		Percent Of Total	
Nonagriculture				
Public land	24,838		4.03	
Developed land	61,000		9.91	
Water areas	47,488		7.71	
		133,326		21.65
Agriculture				
Cropland	68,786		11.17	
Pasture	128,116		20.81	
Forest	117,959		19.16	
Other	167,493		27.20	
		482,354		78.34
Total		615,680		100.00

Source: Land Use Plan for the Gainesville Urban Area, May 1970.

TABLE 3-2

EXISTING LAND USE
GAINESVILLE URBAN AREA

Land Use	Existing Land Use (acres)		Percent of Development Area	
Single family	5,793		24.86	
Multiple family	488		2.09	
Mobile home	370		1.59	
Total Residential		6,651		28.54
Retail	520		2.23	
Office	60		0.26	
Industrial	301		1.29	
Wholesale	90		0.39	
Public and Semipublic (Major institutional uses)	8,733 (6,597)		37.48 (28.31)	
Public right-of-way	6,945		29.81	71.46
Total Nonresidential		16,649		100.00
Total Developed, Zoned or Recommended for Development		23,300		
Vacant		63,401		
Total Urban Area		86,701		

Source: Land Use Plan for the Gainesville Urban Area, May 1970.

TABLE 3-3

ESTIMATED AGRICULTURAL LAND CAPABILITIES – 1972
ALACHUA COUNTY

Class	Acres	Percent Agr.	Description
I		-0-	Suitable for cultivation--few limitations to restrict use.
II	62,660	12.3008	Some limitations that reduce choice of plants or require moderate conservation practices.
III	259,226	50.8885	Severe limitations in choice of plants, or special conservation practices required, or both.
IV	159,631	31.3371	Very sever limitations in choice of plants, or very careful management required, or both.
V	20,775	4.0784	Use limited to pasture, range, woodland, wildlife food and cover. Limitations prevent normal tillage of cultivated crops.
VI	2,954	.5797	Unsuited for cultivation. Use limited to pasture, range, woodland, wildlife food and cover.
VII	554	.1087	Use limited to grazing, woodland, or wildlife.
VIII	3,600	.7068	Unsuited for commerical plant production. Use restricted to recreation, wildlife, water supply, or aesthetic purposes.
	509,400		
Urban build-up	61,000		
Total	**570,400**		

Source: Comprehensive Area-Wide Plan for Water and Sewer Development, Alachua County, Florida, 1967a.

TABLE 3-4

COUNTY OWNED
RECREATION AREAS IN ALACHUA COUNTY

Category	Site Name	Size (acres)	Facilities
County Parks			
Special Use Facilities	River Styx Boat Ramp	—	Boat ramp only
	Lake Jeffords Boat Launch	—	Boat ramp only
	Lochloosa Station Boat Ramp	.4	Boat ramp only
	Melrose Bay Boat Ramp	—	Boat ramp only
Neighborhood Parks	Watermelon Pond Park	10	Boat ramp only
	Monteocha-Gordon Community Center		Softball field
	Newnans Lake Park	7½	Boat ramp, picnic and restroom facilities
	Holden Park	3	Boat ramp and picnic tables
	Waldo Park	—	Boat ramp and docks, picnic tables
District Parks	Santa Fe Lake Park	25	None
	Lake Altho Park	20	Double boat ramp and picnic area
	Newnans Lake East Park	21	Boat ramp and restrooms
	McCall Park	80	Boat ramp only
	Marjorie K. Rawlings Park	25	Historic site, boat ramp

Source: Open Space and Recreation Study, 1973.

TABLE 3-5

EXISTING NEIGHBORHOOD PARKS
GAINESVILLE URBAN AREA

Park	Current Size (acres)	Acres Per 1,000 Pop. (acres)	Service Radius (miles)	Population Served
Woodlawn Park	5	3.3	1/2	1,500
Green Acres Park	20	5.0	1/2	4,000
Jr. Woman's Club Park	1	1.0	1/4	1,000
Kiwanis Park	2.5	1.8	1/2	3,000
Smokey Bear Park	4	1	1/2	4,000
Young American Park	5	2.5	1/2	2,000
Lake Terrace Park	2.5	1.5	1/2	4,000
Community Recreation Center	1	1	1/2	1,000
Neighborhood Open Space	1.5	.7	1/2	2,000
Tumblin' Creek Park	3.5	2.3	1/4	1,500

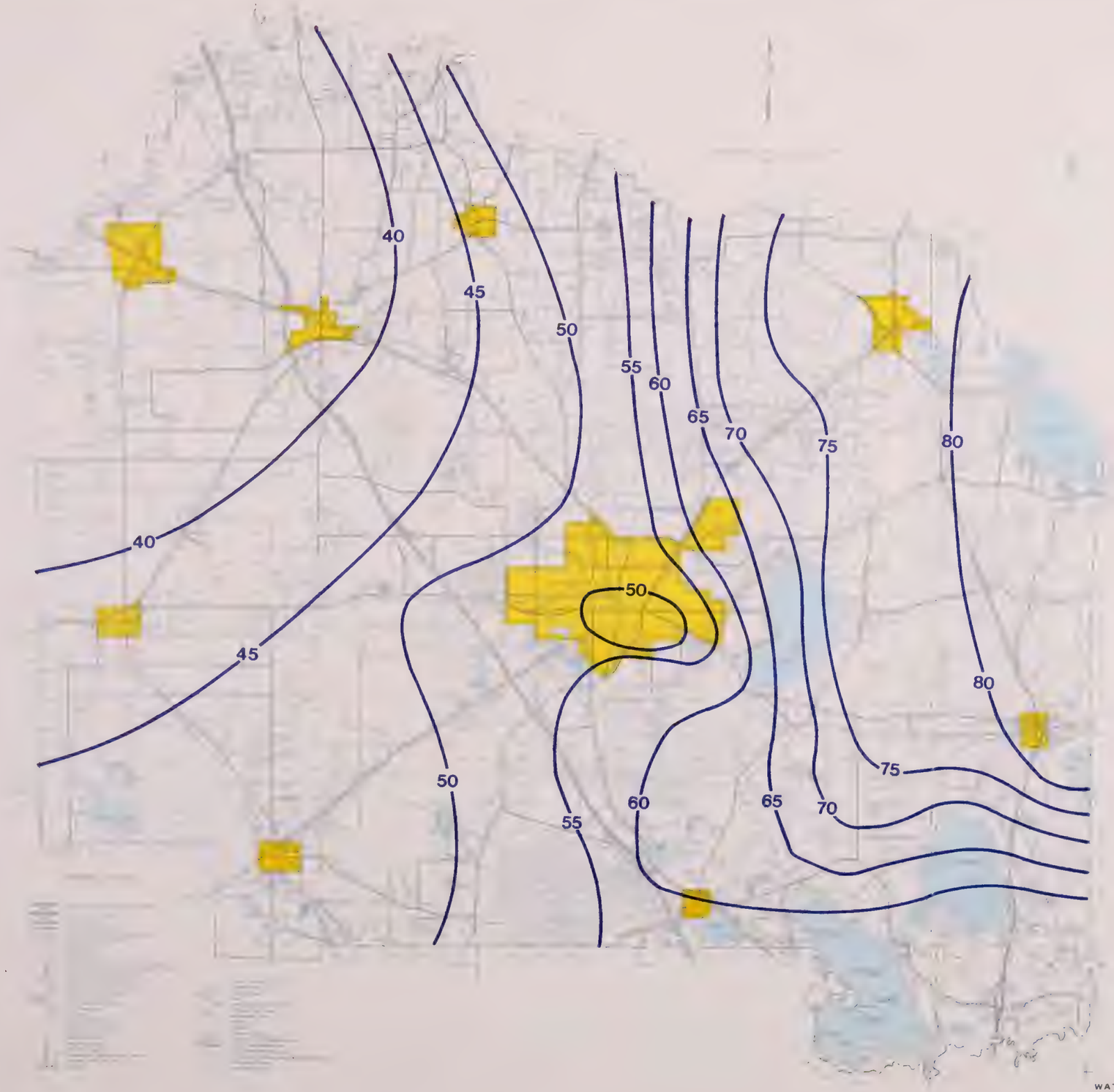
Source: Open Space and Recreation Study, 1973.

TABLE 3-6

EXISTING DISTRICT PARKS
GAINESVILLE URBAN AREA

Park	Current Size (acres)	Acres per 1,000 Pop. (acres)	Service Radius (miles)	Population Served
Lincoln Park	36	4.5	2	8,000
Northeast Park	21	2.3	1	9,000
Westside Park	27	1.9	2	14,500
Meadowbrook Park	13	1.7	1.5	8,000

Source: Open Space and Recreation Study, 1973.



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POTENTIOMETRIC CONTOUR MAP

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

BLACK, CROW AND EIDSNESS, INC
ENGINEERS

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CORRIDOR DEVELOPMENT

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY

NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

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SPOT DEVELOPMENT

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY

NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

BLACK, CROW AND EIDSNESS, INC.

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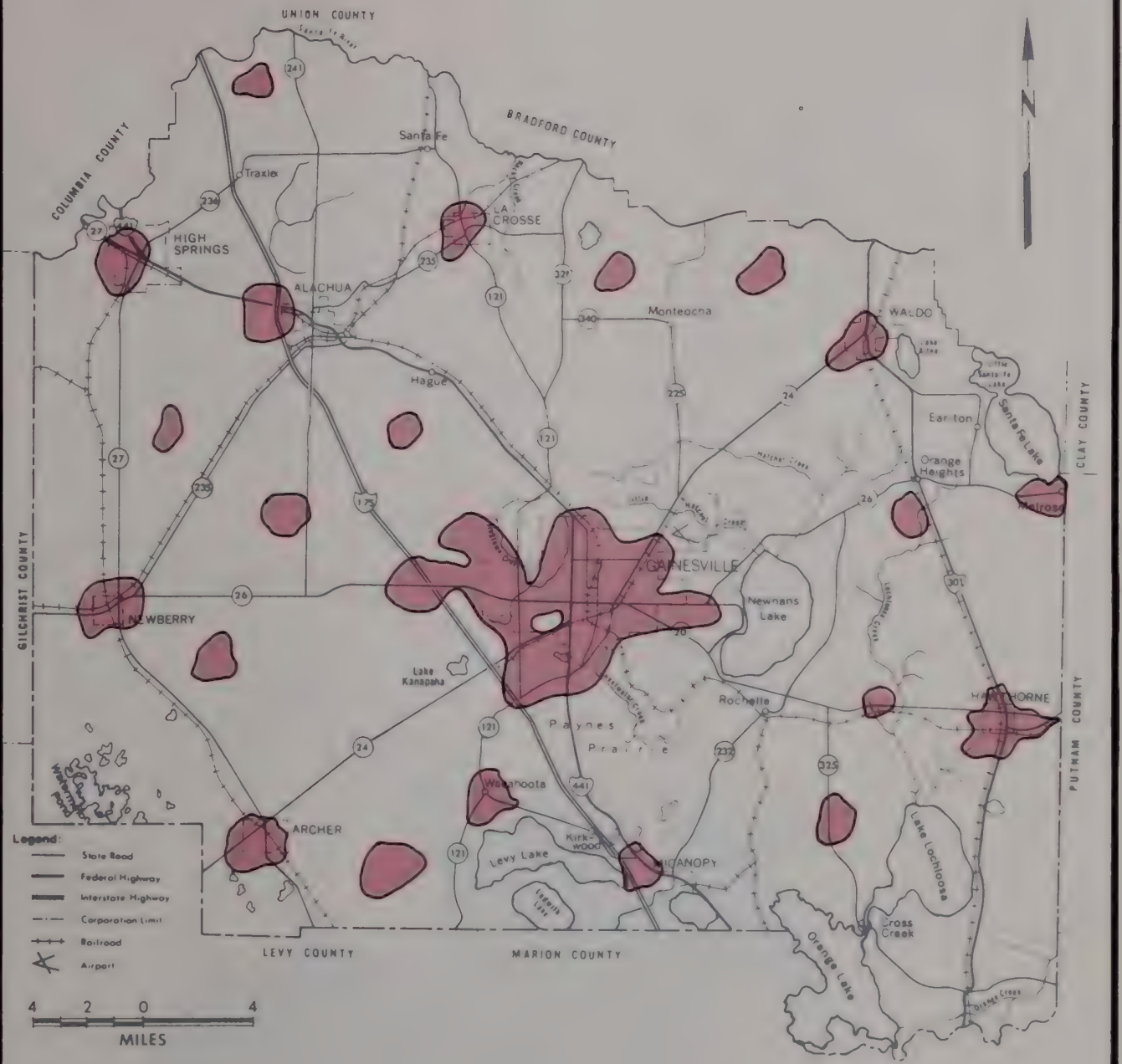

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COMPACT DEVELOPMENT

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY

NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

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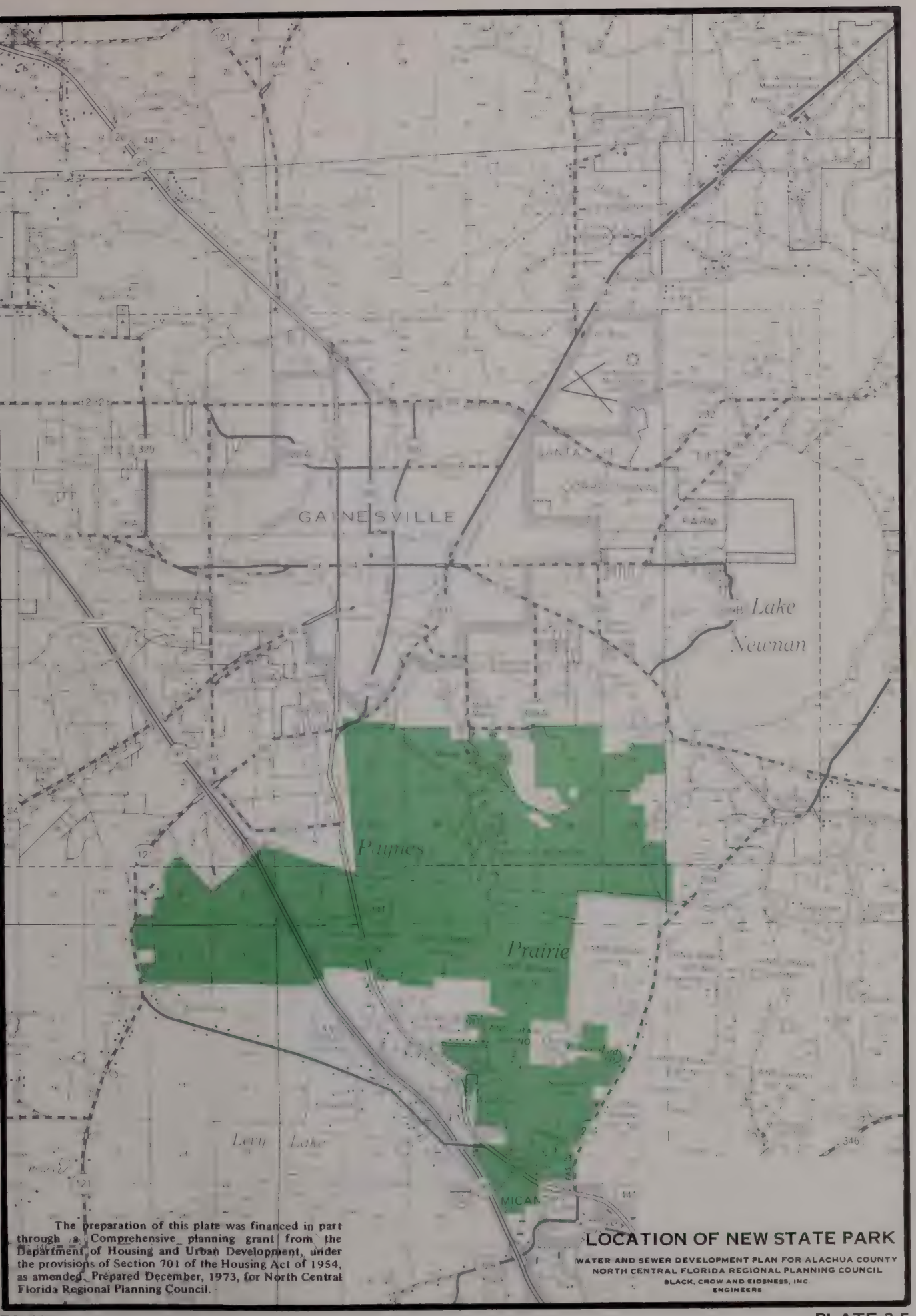

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LOCATION OF NEW STATE PARK

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
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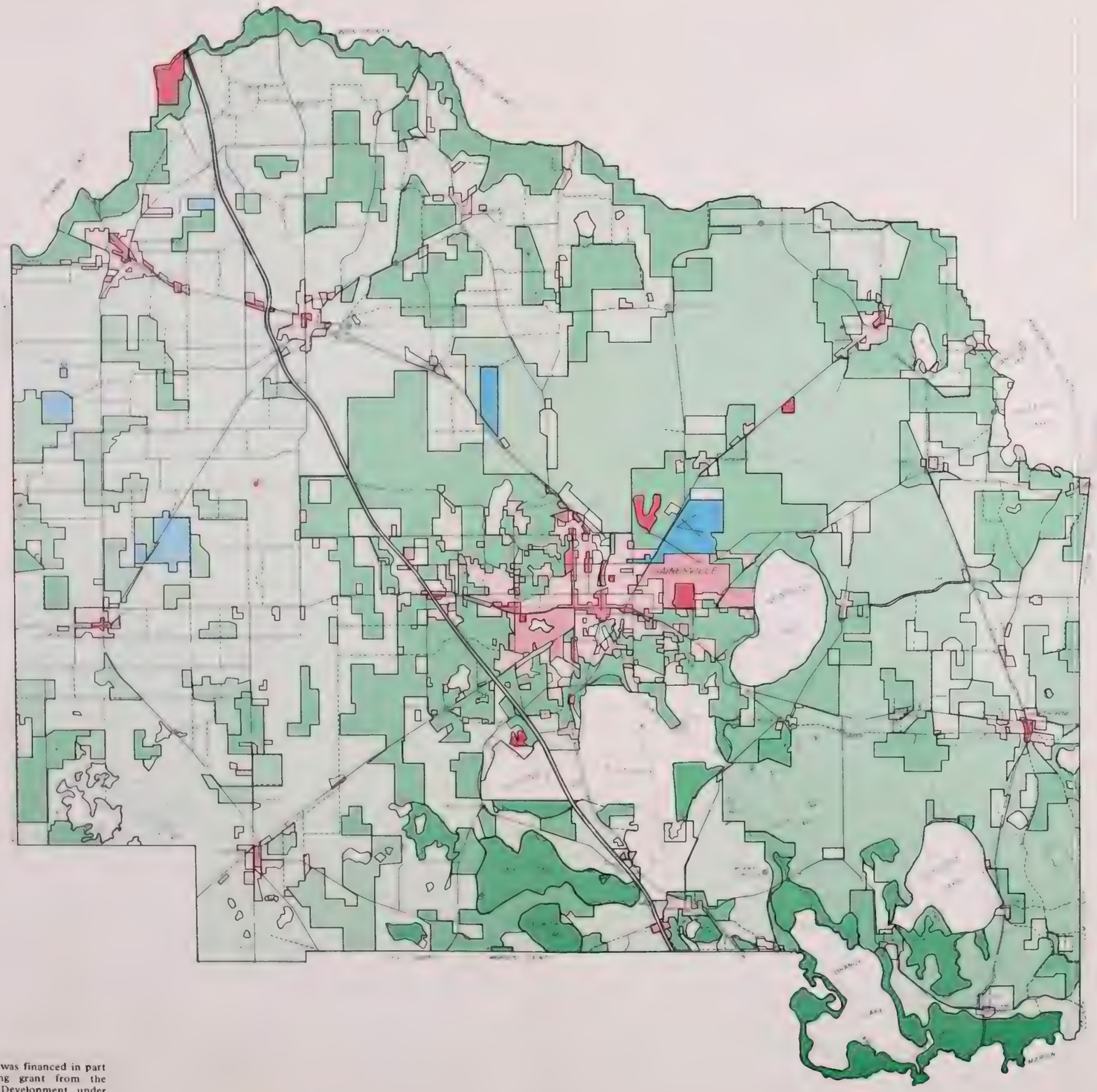

COMMERCIAL

INSTITUTIONAL

TRANSPORTATION, COMMUNICATION AND UTILITIES

INDUSTRIAL

RESIDENTIAL

MINING

RECREATIONAL

COMMERCIAL FORESTRY

AGRICULTURAL

VACANT

SWAMPLAND

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LAND USE PLAN

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS

SECTION 4

POPULATION

4.1 GENERAL

The major determinant for ascertaining the demand and requirements for water and sewer facilities of an area is its demographic characteristics. Not only is the total number of people important, but also their spatial, social, and economic distribution. This section summarizes those population charateristics pertinent to a general water and sewer systems study.

4.1.1 Population Trends in Florida

Because the population trends and characteristics of a county are to a large degree determined by similar trends at the state level, it is necessary to note the demographic activities of Florida. Since 1950, the State of Florida has undergone tremendous growth, increasing from a population of 2,771,305 in 1950 to 6,789,383 in 1970, an increase of 145 percent.

Recent population estimates indicate that this rapid growth is continuing, if not accelerating. Population estimates by the U. S. Bureau of the Census place the 1972 state population at 7,259,000, an increase of 469,000 or 6.9 percent since 1970. This increase places Florida second only to California in the absolute number of new citizens and second only to Nevada in percentage increase.

4.1.2 Population Trends in Alachua County

The growth of the State has had a great many effects, both direct and indirect, on the population of Alachua County. From 1950 to 1970, the population in Alachua County increased from 57,026 to 104,764 or a gain of 83.7 percent. While this increase does not approach that of the State for the same period, it is worthy of note that from 1960 to 1970 the percentage increase in population in Alachua County exceeded that of the State of Florida. Alachua County's growth during that period places it among the 30 fastest growing metropolitan areas in the nation. The latest available estimate of the county population is 115,824.

4.2 POPULATION GROWTH FACTORS

Alachua County's population changes have been the result of two forces—natural change and net migration. Natural change is the difference between the

number of births and the number of deaths; net migration is the difference between the number of people moving into a given area and those moving out of a given area.

4.2.1 Migration

In Alachua County net migration has been of increasing significance as a demographic factor over the past 20 years. It is obvious from Table 4-1 that net migration is a strong positive factor on total population shift in Alachua County. The total effect of the University of Florida on the migration patterns is even greater than reflected in Table 4-2. This is due to the fact that approximately one-fifth of the student body is married. Also, increased student enrollments result in additional university employees. This additional population (spouses of married students) is not included in the percentage increase in net migration at the University of Florida.

4.2.2 Age-Sex Distribution

As indicated in Table 4-3, the age distribution of the population of Alachua County has undergone some significant changes over the past 20 years. The percent of population under the age of five has dropped from a high of 11.7 percent in 1960 to a low of 8.4 percent in 1970. This drop is a direct result of the low birth rates which prevailed during the last half of the 1960s.

The 15-24 age group increased 5.5 percentage points, from 23.4 percent to 28.9 percent from 1960 to 1970. This jump reflects both the increased enrollment at the University of Florida and the relatively high birth rate of the period in which this age group was born.

4.2.3 Household Size

Household formation is an important indication of the socioeconomic structure of an area. Changes in the household patterns determine, to a large extent, demand changes in such commodities as housing units, utilities, and transportation needs. As expected in an area of population growth, the number of households in Alachua County has increased over the past 20 years. In fact, the percentage increase of households exceeded that of total population growth in both of the periods 1950 to 1960 and 1960 to 1970. During the former decade, the number of households increased 31.5 percent while the total population increased 29.9 percent. Likewise, during the latter period, the number of households increased by 59.4 percent as compared to a 41.4 percent population increase.

For classification purposes, residents of Alachua County live in households, group quarters, or in institutions. In 1950, 88.7 percent of the population lived in households; in 1960, 88.5 percent; and in 1970, 90.8 percent. Of the household

population in 1950, 83.4 percent lived in multimember households, while 16.6 percent were in singlemember households. By 1970, the multimember household population was down to 76.3 percent of the total while singlemember households were up to 23.7 percent. The increase from 3,246 singlemember households in 1960 to 7,386 in 1970 represents a 127.5 percent increase as compared to only a 45.8 percent increase in multimember households during the same period. That household formations increased faster than population growth, and that singlemember households have increased more rapidly than multimember households is reflected in the changes in average persons per household over the past 20 years. In 1950 the county average was 3.41 persons per household; in 1960, 3.36; and in 1970, 3.06. Within subsectors of the population there are significant variations in household sizes. For example, an analysis of the 1970 household size in the Gainesville urban area reveals that household size increases as the distance from the center of the city increases. This trend reflects the tendency of suburban households to be larger than those downtown and around the University of Florida. Likewise, the average household size in Gainesville, 2.94 persons per household, was less than that of the county as a whole. When the corporate area of Gainesville is excluded, the household size for the remainder of the county is 3.24. Table 4-4 depicts the average household sizes of communities in Alachua County.

4.3 POPULATION CENTERS

Not only has the county experienced considerable population growth, but also some changes in its population distribution. Generally, Gainesville has been the major growth center, other incorporated areas have experienced some growth, and the farm population has fluctuated.

4.3.1 Incorporated Areas

As shown in Table 4-5 all incorporated areas in the county have experienced some growth over the past 20 years. On January 1, 1962, the city of Gainesville annexed 17 square miles and increased the population with the corporate limits of Gainesville by almost 19,000 persons. The figure of 46,146 is the 1960 population (as estimated by the Gainesville Department of Community Development) within the corporate limits as they existed after the 1962 annexation. The population as reported by the U. S. Census for Gainesville in 1960 was 29,701. However, the 46,146 figure is the more meaningful one and is in current use.

Residents of the incorporated areas represented 59.6 percent of the total county population in 1950, 74 percent in 1960, and 71.5 percent in 1970. Gainesville's share of the county population was 47.1 percent in 1950, 62.4 percent in 1960, and 61.5 percent in 1970. This means that only 12.5 percent, 11.9 percent, and 9.8 percent of the county population lived in incorporated areas other than Gainesville in 1950, 1960, and

1970, respectively. Moreover, that this percentage is decreasing indicates that population growth of all the incorporated areas (note that Gainesville's share also decreased from 1960 to 1970) is not matching the growth rate of the county as a whole, although the population of each has increased. A graphical representation of growth in Alachua County and the nine incorporated communities is presented on Plate 4-1.

4.3.2 Farms

While the population of the incorporated areas has been increasing in absolute terms but decreasing as a percent of the total, the county farm population appears to have bottomed out during the 1960s and then experienced a slight increase. In 1950, 7,851 persons were identified as farm residents. By 1960, the number of farm residents had dropped to 3,401—a decrease of 56.7 percent. This drop was due, at least in part, to a change in classification. In 1970, 3,852 county residents were classified as living on farms—a 13.3 percent increase over the 1960 figure. This slight increase in farm residents parallels a similar trend in agricultural employment and the number of farms in the county covered in the employment section of this study. While no solid conclusions can be drawn from this data, overall there is some indication that the farm population of the county is tending to stabilize.

4.3.3 The Gainesville Urban Area

With the farm population stabilizing and the population growth of the incorporated areas not matching the county growth rate, the major growth areas must be, and are, elsewhere within the Gainesville urban area. This area, shown on Plate 4-2, had an estimated population of 53,111 in 1960 and 82,411 in 1970. This growth represents an increase of 55 percent as compared with 35 percent for all the incorporated areas and 40 percent for the city of Gainesville during the same time period. This total urban area population accounted for 71.7 percent of the total county population in 1960 and 78.8 percent in 1970. Moreover, the 29,300 increase between 1960 and 1970 accounted for 95.5 percent of the total county population increase during this period.

4.4 POPULATION PROJECTIONS

To plan for future demands for water and sewer facilities, it is necessary to have some idea of future population levels. The North Central Florida Regional Planning Council has produced a set of population projections for Alachua County. These are shown on Tables 4-6 and 4-7. For additional detail on these projections (Population and Economic Study. July 1972).

The State of Florida has estimated that the 1972 populations for Gainesville and Alachua County are 68,988 and 115,856, respectively. Both figures indicate that the rate of growth of each is such that the medium population projections for 1975 will be exceeded at that date. Similar trends appear to be developing in several of the smaller communities in the county. Because of this higher than anticipated growth rate, it appears that utilization of the high population projection estimates for each city will more closely approximate actual figures in future years.

TABLE 4-1

NEW MIGRATION
FOR THE PERIOD 1950-1970
ALACHUA COUNTY

	1950-1960	1960-1970	1970
Actual population	57,026	74,074	104,764
Expected natural increase	11,532	13,972	
Total expected population due to natural increase	68,558	88,046	
Actual net migration	+5,516	16,718	
Percent of the change in population due to net migration	32%	54%	

Source: Population and Economic Study, July 1972.

TABLE 4-2

NET MIGRATION AND UNIVERSITY OF FLORIDA STUDENT ENROLLMENT
FOR THE PERIOD 1950-1970
ALACHUA COUNTY

	1950-1960	1960-1970
Net migration	5,516	16,718
Enrollment increase	3,023	9,153
Enrollment increase as percent of net migration	55%	55%

Source: Population and Economic Study, July 1972.

TABLE 4-3

1950-1970 AGE DISTRIBUTION BY SEX
ALACHUA COUNTY

	Age	1950 Number	1950 Percent	1960 Number	1960 Percent	1970 Number	1970 Percent
Total	0-4	6,310	11.1	8,669	11.7	8,785	8.4
	5-14	8,887	15.6	13,862	18.7	18,861	18.1
	15-24	13,646	23.9	17,396	23.4	30,298	28.9
	25-34	9,643	16.9	10,031	13.6	14,775	14.0
	35-44	6,799	11.9	8,000	10.9	9,669	9.2
	45-54	4,979	8.7	6,764	9.1	8,889	8.5
	55-64	3,292	5.8	4,673	6.3	6,903	6.7
	65 and over	3,470	6.1	4,679	6.3	6,584	6.3
	Total	57,026		74,074		104,764	
Male	0-4	3,205	10.6	4,380	11.6	4,518	8.7
	5-14	4,440	14.8	7,060	18.7	9,600	18.4
	15-24	8,292	27.5	9,848	26.0	15,705	30.0
	25-34	5,147	17.1	5,179	13.7	7,640	14.6
	35-44	3,378	11.2	3,828	10.1	4,628	8.9
	45-54	2,435	8.1	3,284	8.6	4,178	8.0
	55-64	1,600	5.3	2,228	5.9	3,210	6.2
	65 and over	1,632	5.4	2,048	5.4	2,738	5.2
	Total	30,129		37,855		52,217	

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TABLE 4-3 — *Continued*

	Age	1950 Number	1950 Percent	1960 Number	1960 Percent	1970 Number	1970 Percent
	0-4	3,105	11.5	4,289	11.8	4,267	8.1
	5-14	4,447	16.5	6,802	18.7	9,261	17.6
	15-24	5,354	19.9	7,548	20.6	14,593	27.7
Female	25-34	4,496	16.7	4,852	13.3	7,135	13.5
	35-44	3,421	12.7	4,172	9.3	5,041	9.6
	45-54	2,544	9.5	3,480	9.6	4,711	9.0
	55-64	1,692	6.3	2,445	6.7	3,693	7.1
	65 and over	1,838	6.9	2,631	7.3	3,846	7.3
	Total	26,897		36,219		52,547	

Source: Population and Economic Study, July 1972.

219-73-50

TABLE 4-4

AVERAGE HOUSEHOLD SIZES
FOR THE YEAR 1970
FLORIDA, ALACHUA COUNTY, AND SELECTED COMMUNITIES

Area	Persons per Household
Florida	2.90
Alachua County	3.06
Gainesville	2.94
Alachua	3.60
High Springs	3.20
Newberry	3.21
Hawthorne	3.30

Source: Population and Economic Study, July 1972.

TABLE 4-5

POPULATION TRENDS
FOR THE PERIOD 1950-1970
INCORPORATED AREAS OF ALACHUA COUNTY

Incorporated Areas	1950	1960	Percent Change 1950-60	1970	Percent Change 1960-70
Alachua	1,116	1,974	76.8	2,252	14.1
High Springs	2,088	2,329	11.5	2,787	19.7
LaCrosse	146	165	13.0	365	121.2
Waldo	647	735	13.6	800	8.8
Newberry	873	1,105	31.7	1,247	12.9
Archer	586	707	20.7	898	27.0
Micanopy	612	658	7.5	759	15.4
Hawthorne	1,058	1,167	10.3	1,126	-3.5
Gainesville	26,861	46,146	71.8	64,510	39.8

Source: Population and Economic Study, July 1972.

TABLE 4-6

PROJECTED POPULATION LEVELS
FOR THE PERIOD 1975-1990
ALACHUA COUNTY

Year	Low	Medium	High
1975	117,903	119,730	126,780
1980	128,455	135,056	152,743
1985	139,308	151,951	181,461
1990	150,426	169,813	213,444

Source: Population and Economic Study, July 1972.

TABLE 4-7

PROJECTED POPULATION LEVELS FOR SELECTED AREAS
FOR THE PERIOD 1975-1990
ALACHUA COUNTY

	Year	Low	Medium	High
	1975	2,575	3,385	4,195
Alachua	1980	2,850	3,550	5,250
(2,252)*	1985	3,110	4,100	5,500
	1990	3,750	4,450	5,825
	1975	908	990	1,013
Archer	1980	987	1,110	1,150
(898)*	1985	1,075	1,220	1,290
	1990	1,175	1,350	1,465
	1975	1,140	1,250	1,370
Hawthorne	1980	1,200	1,315	1,460
(1,126)*	1985	1,272	1,408	1,545
	1990	1,322	1,480	1,639
	1975	2,975	3,030	3,300
High Springs	1980	3,190	3,300	3,610
(2,787)*	1985	3,425	3,600	3,930
	1990	3,675	3,945	4,450
	1975	385	430	465
LaCrosse	1980	417	485	560
(365)*	1985	438	545	655
	1990	460	600	750
	1975	770	804	822
Micanopy	1980	782	860	900
(759)*	1985	822	923	990
	1990	865	895	1,097
	1975	1,320	1,365	1,580
Newberry	1980	1,400	1,490	1,780
(1,247)*	1985	1,477	1,625	2,000
	1990	1,570	1,775	2,250

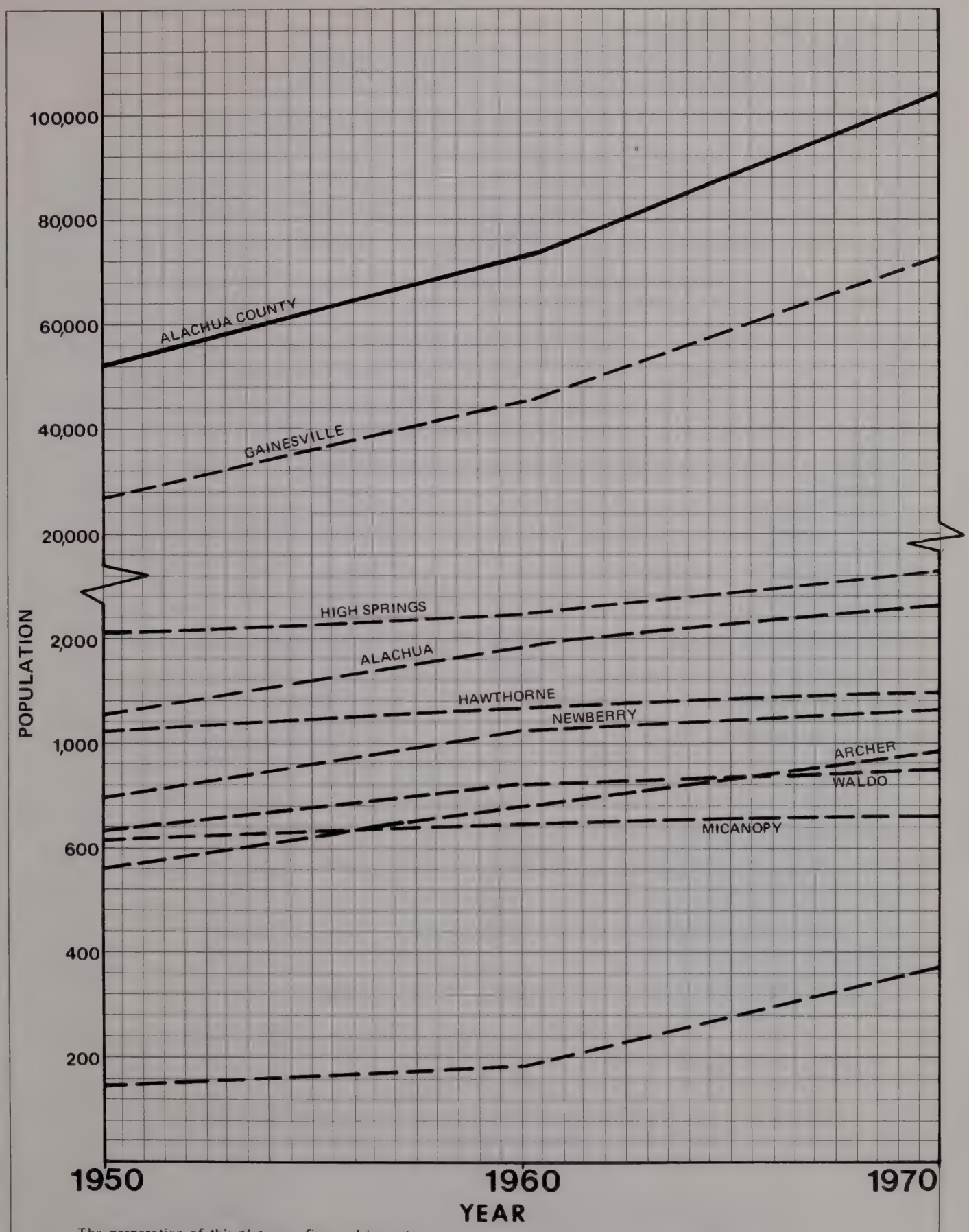
TABLE 4-7 — *Continued*

	Year	Low	Medium	High
	1975	832	845	890
Waldo	1980	875	895	945
(800)*	1985	913	935	1,010
	1990	958	995	1,075
Gainesville	1975	100,217	101,700	107,763
Urban Area	1980	113,040	118,849	134,413
(82,411)†	1985	125,377	136,755	163,314
	1990	135,383	152,831	192,099

Source: Population and Economic Study, July 1972.

*1970 Population census.

†1972 Population estimate.



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POPULATION GROWTH
ALACHUA COUNTY AND SELECT COMMUNITIES
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
CONSULTING ENGINEERS

SECTION 5

ECONOMIC CONDITIONS

5.1 GENERAL

The Gainesville urban area, with approximately 80 percent of the county's population, plays a dominant role in most economic aspects of the area. This role is especially obvious as a retail trade center, an increasingly important medical center, and as the home of the University of Florida.

5.2 PRESENT ECONOMY

Gainesville not only serves Alachua County as a retail trade center, but also has a commercial sphere of influence which is roughly defined as the area bounded by the communities of Ocala, Cedar Key, Mayo, Lake City, Lawtey, Starke, Keystone Heights, and Palatka.

By almost any measurement, retail trade in Gainesville and Alachua County has experienced considerable growth in recent years. Total retail sales, as reported by Sales Management Magazine, increased from $76,168,000 in 1960 to $183,294,000 in 1970—an increase of 141 percent. As shown in Table 5-1, retail food stores experienced the greatest dollar increase in sales while general merchandise had the largest percentage increase.

5.2.1 The University of Florida

As the single largest employer in Alachua County, the University of Florida is a major determinant of the economic climate of the Gainesville urban area and consequently the county. In 1970, the University's payroll employment was 13,360 with a monthly payroll in excess of $8 million. The economic parameters of the importance of the University are greater than its sole contributions as an employer. It is also an attractor of 30,000 consumers of goods and services which produces more employment.

5.2.2 Regional Medical Center

The Gainesville urban area is a major regional medical center. The catalyst for this growth is the University medical facilities centered around the 450-bed Shands Teaching Hospital and a new dental school. In addition to Shands, there is the relatively new (1967-68) 360-bed VA Hospital, Alachua General Hospital, which will have

approximately 400 beds when current expansion is completed, and the recently completed 187-bed private hospital, the North Florida Regional Hospital. The total impact of the medical community on the area's economy is tremendous and there is considerable potential for further growth.

5.2.3 Agriculture

Agriculture is one of the few economic activities in Alachua County not dominated by the Gainesville urban area. The major impact of agricultural activity is not as an employer, but rather its dollar value to the county and its effect on land uses in the area. The Alachua County Agent's office estimates that the total value received for farm products in Alachua County is in excess of $30 million annually, and that of the 570,880 acres in the county, over 370,000 acres are in agricultural uses.

After years of steady decline, the agricultural industry in Alachua County seems to have leveled off. In 1959 there were according to the United States Census, 1,073 farms in the county; in 1964, there were 1,041; and in 1970, according to the County Agent's estimate, there were 1,172. The Agribusiness Institute of Florida estimated the 1970 figure at 1,050 plus or minus. The difference is primarily one of definition. The Census Bureau defines a farm as places of 10 acres or more from which sales of farm products amounted to $50 or more in the previous calendar year or places of less than 10 acres from which sales of farm products amounted to $250 or more. The County Agent's office definition is somewhat more liberal, a farm being an area on which the primary activity is agriculturally oriented.

Despite what might be a slight decline in the number of acres in agricultural uses, the value of agricultural products in the county has increased. The County Agent's office estimated that in 1967 the farm produce value was in excess of $23,600,000 and by 1972 had increased to $30,000,000.

5.3 EMPLOYMENT

5.3.1 Labor Force and Employment

As a result of the economic growth in Alachua County over the past 20 years, there have been significant gains in the area's labor force. Percentagewise, the growth of the labor force has exceeded the increase of the population. From 1950 to 1960, the labor force increased by 36.8 percent, while the total county population was increasing 29.9 percent. Likewise, from 1960 to 1970, the labor force rose by 50.2 percent compared to a population increase of 41.4 percent.

5.3.2 Employment of Occupation

When the labor force is broken down by occupation, the results are as shown in Table 5-2. The single largest group of employees is classified as professional, technical, and kindred workers with 25.4 percent of all workers falling in this category. The classification with the next most employees is clerical and kindred workers with 17.9 percent of the county employees. The dominance of these two occupational groups is a reflection of the importance of government employment in general and the University of Florida in particular in the county.

5.4 FAMILY INCOME

While all measures of income are useful tools for comparisons and analyses of growth trends, many are nonrepresentative of actual income distribution in that money is neither earned nor spent on these bases. For this reason, an examination of family income is essential since this is the most prevalent earning and spending unit. The U. S. Census Bureau publishes family income levels as part of its decennial census reports.

As shown on Plate 5-1, family income has increased significantly over the past 20 years at all levels. It is especially noteworthy that Alachua County has made substantial progress toward reaching the state and national levels. For example, in 1950, 66.9 percent of the families in the county earned less than $3,000 a year as compared to 42.5 percent at the national level—a difference of 24.4 percentage points. By 1969, this difference had dropped 4 percentage points—9.3 percent for the nation and 13.3 percent for the county. Table 5-3 illustrates these trends.

According to the Census Bureau, the median family income for 1949, 1959, and 1969 for Alachua County was $2,066, $4,471, and $8,329, respectively. This represents an increase of 116.4 percent between 1949 and 1959, 86.3 percent between 1959 and 1969, and 303.1 percent between 1949 and 1969.

5.5 HOUSING CONDITIONS

As the number, type, condition, and location of housing units form one of the primary parameters of water and sewer demand, it is essential that the existing and projected housing situation be understood.

5.5.1 Number, Type, and Tenure

From 1950 to 1970 the county's population increased from 57,026 to 104,764—an increase of 83.7 percent. During this same period the number of total dwelling units increased from 15,988 to 33,538, a 109.7 percent increase.

Of the 15,988 total units in 1950, 12,251 or 76.6 percent were singlefamily units; 3,379 or 21.2 percent were multifamily units; and 353 or 2.2 percent were mobile homes. By 1970, there were 23,273 singlefamily units, 8,201 multifamily units, and 2,046 mobile units. These figures represent 69.4 percent, 24.5 percent, and 6.1 percent of the total units, respectively. As is evident from these data, multifamily units and mobile homes constituted a larger share of the total units in 1970 than in 1950. This is a trend which has been nationwide. The rising costs of singlefamily homes, the improved technology in the mobile home industry, enhanced amenities in mobile homes and apartments, and changing consumer tastes have all interacted to produce this trend. Developments since 1970 indicate that this trend is continuing.

Of the 14,811 occupied dwelling units in the county in 1950, 52.8 percent were owner-occupied and 47.2 percent were renter-occupied. By 1970, 60.8 percent were owner-occupied, with 39.2 percent being occupied by renters.

5.5.2 Persons Per Dwelling Units

In 1950, the median number of persons per dwelling unit was 3.0. In 1970, the median had dropped to 2.7. There has been a rather consistent difference between the medians of owner-occupied units and renter-occupied units. In 1950, the medians were 3.2 and 2.8 for owner and renter, respectively. In 1970, the figures stood at 3.0 for owners and 2.3 for renters. Table 5-4 depicts the distribution of housing units by the number of inhabitants since 1950.

The downward trend of median number of persons per dwelling unit is to be expected as dwelling units increased at a faster rate than did population growth. Additionally, changing life styles and earlier family separations have contributed to this trend. Finally, the increased enrollment at the University of Florida has generated a greater demand for apartments and mobile homes--two dwelling units which consistently house fewer people per unit than do singlefamily homes.

5.5.3 Values and Rents

As have almost all consumer products and services, the value of homes and rent levels has increased significantly over the past 20 years. In 1950 the median value of owner-occupied dwelling units was $5,627, in 1960 the median value had risen to $10,600, and by 1970 had reached $14,100. This represents a 150 percent increase in the past 20 years. Additionally, it is meaningful to note that the number of sound housing units which appear on the market in the price range of $14,000 and under is extremely limited. Rent levels have increases at a level slightly greater than home values. In 1950 the median monthly rent in Alachua County was $35, by 1960 it has risen to $58, and in 1970 reached $89.

5.5.4 Plumbing Facilities

Because of its inherent impact on water and sewer services, it is important to note the scope of the housing situation with regard to the provision of plumbing facilities. The U. S. Bureau of the Census, which is the primary source of data for this subject, provides the following definition: plumbing facilities include toilet facilities, bathing facilities, and water supply. Tabulations of plumbing facilities are considered a measure of housing quality. Housing units are classified by plumbing facilities as follows:

1. *With all plumbing facilities*—housing units which have piped hot and cold water inside the structure, flush toilet, and bathtub or shower inside the structure for use only by the occupants of the unit (including roomers, boarders, and other nonrelatives) are considered to have all plumbing facilities.

2. *Lacking some or all plumbing facilities*—housing units which lack one or more plumbing facilities, i.e., which lack piped hot and/or cold water, lack toilet or bathtub, or have toilet or bathing facilities used also by occupants of another unit.

Table 5-5 is based on this set of definitions. As is evident from the table, the problem is most acute in the smaller communities.

5.5.5 Housing Conditions

While the status of plumbing facilities has often been used as a prime indicator of housing conditions it does not provide a complete picture. Housing units without complete plumbing may be substantial.

The North Central Florida Regional Planning Council conducted a visual housing conditions survey of the incorporated areas within the county (except Gainesville). The results of that survey are indicated in Table 5-6. For the Gainesville urban area a condition rating for residential structures using tax assessors' records was devised. Based on this evaluation method it was estimated that approximately 10 percent of the dwelling units was dilapidated, 18 percent deteriorating, and 72 percent sound.

TABLE 5-1

RETAIL SALES IN THOUSANDS OF DOLLARS
FOR THE PERIOD 1960-1970
ALACHUA COUNTY

Retail Sales	1960	1970	Dollar Increase	Percent Increase
Food	$20,666	$ 44,193	$ 23,257	114
Eating and drinking	4,113	12,286	8,173	199
General merchandise	7,204	23,708	16,504	229
Apparel	4,749	8,459	3,710	78
Furniture	3,680	7,347	3,667	99
Automobile	15,215	33,000	17,785	117
Gas station	6,575	17,334	10,759	164
Lumber and hardware	5,783	7,977	2,194	38
Drug	2,873	5,840	2,967	103
Total	$76,168	$183,294	$107,126	141

Source: Population and Economic Study, July 1972.

TABLE 5-2

EMPLOYMENT BY MAJOR OCCUPATION GROUP
FOR THE YEAR 1970
ALACHUA COUNTY

Occupation Group	Number	Percent
Professional, technical and kindred workers	10,065	25.4
Managers and administrators	3,374	8.5
Sales workers	2,828	7.1
Clerical and kindred workers	7,095	17.9
Craftsmen, foremen and kindred workers	4,071	10.3
Operators and kindred workers	3,361	8.5
Laborers, except farm	1,798	4.5
Farm workers	1,002	2.5
Service workers	4,935	12.5
Private household workers	1,110	2.8
Total employed	39,639	100.0

Source: Population and Economic Study, July 1972.

TABLE 5-3

FAMILY INCOME DISTRIBUTION BY PERCENT
FOR THE PERIOD 1949-1969
U.S.A., FLORIDA, AND ALACHUA COUNTY

	1949			1959			1969		
Income	U.S.A.	Fla.	Alachua County	U.S.A.	Fla.	Alachua County	U.S.A.	Fla.	Alachua County
Less than $3,000	42.5	61.7	66.9	21.7	28.5	31.4	9.3	12.8	13.3
$3,000-5,999	43.3	26.6	26.4	33.2	37.5	34.7	16.6	21.0	21.0
$6,000-9,999	11.0	6.1	5.2	30.8	24.4	22.8	28.1	27.3	26.5
$10,000-14,999	3.3	2.8	1.5	10.6	8.3	7.9	26.7	22.1	21.7
$15,000 and over				3.7	3.3	3.2	19.2	16.8	17.5

Source: Population and Economic Study, July 1972.

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TABLE 5-4

DWELLING UNIT DISTRIBUTION BY NUMBER OF OCCUPANTS
FOR THE PERIOD 1950-1970
ALACHUA COUNTY

Persons	Dwelling Units 1950	1960	1970
1	1,355	2,283	5,072
2	4,421	5,329	9,583
3	3,341	3,892	5,728
4	2,511	3,661	5,181
5	1,423	2,202	2,735
6+	1,760	2,521	2,816

Source: Housing Conditions, July 1972.

TABLE 5-5

OCCUPIED DWELLING UNITS LACKING
ALL OR SOME PLUMBING FACILITIES
FOR THE YEAR 1970
ALACHUA COUNTY

Area	Number of Units Without Plumbing Facilities	Percent of Total Occupied Units
Alachua County	2,563	8.3
Alachua	210	30.4
Archer	77	26.4
Gainesville	643	3.5
Hawthorne	98	25.7
High Springs	173	18.4
Micanopy	69	26.3
Newberry	120	28.2
Waldo	52	17.2

Source: Housing Conditions, July 1972.

TABLE 5-6

SUMMARY OF HOUSING CONDITIONS
SELECTED COMMUNITIES OF
ALACHUA COUNTY
FOR THE PERIOD 1971-1972

Community	Sound		Deteriorating		Dilapidated	
	Number	Percent	Number	Percent	Number	Percent
Alachua	270	40.5	122	18.3	274	41.2
Archer	195	57.1	71	20.8	75	22.1
Hawthorne	181	40.8	98	22.0	165	37.2
High Springs	439	49.4	164	18.4	287	32.2
Micanopy	109	36.9	117	39.5	70	23.6
Newberry	216	49.4	93	21.3	128	29.3
Waldo	122	39.2	97	31.2	92	29.6
Total	1,532	45.3	762	22.5	1,091	32.2

Source: Housing Conditions, July 1972.

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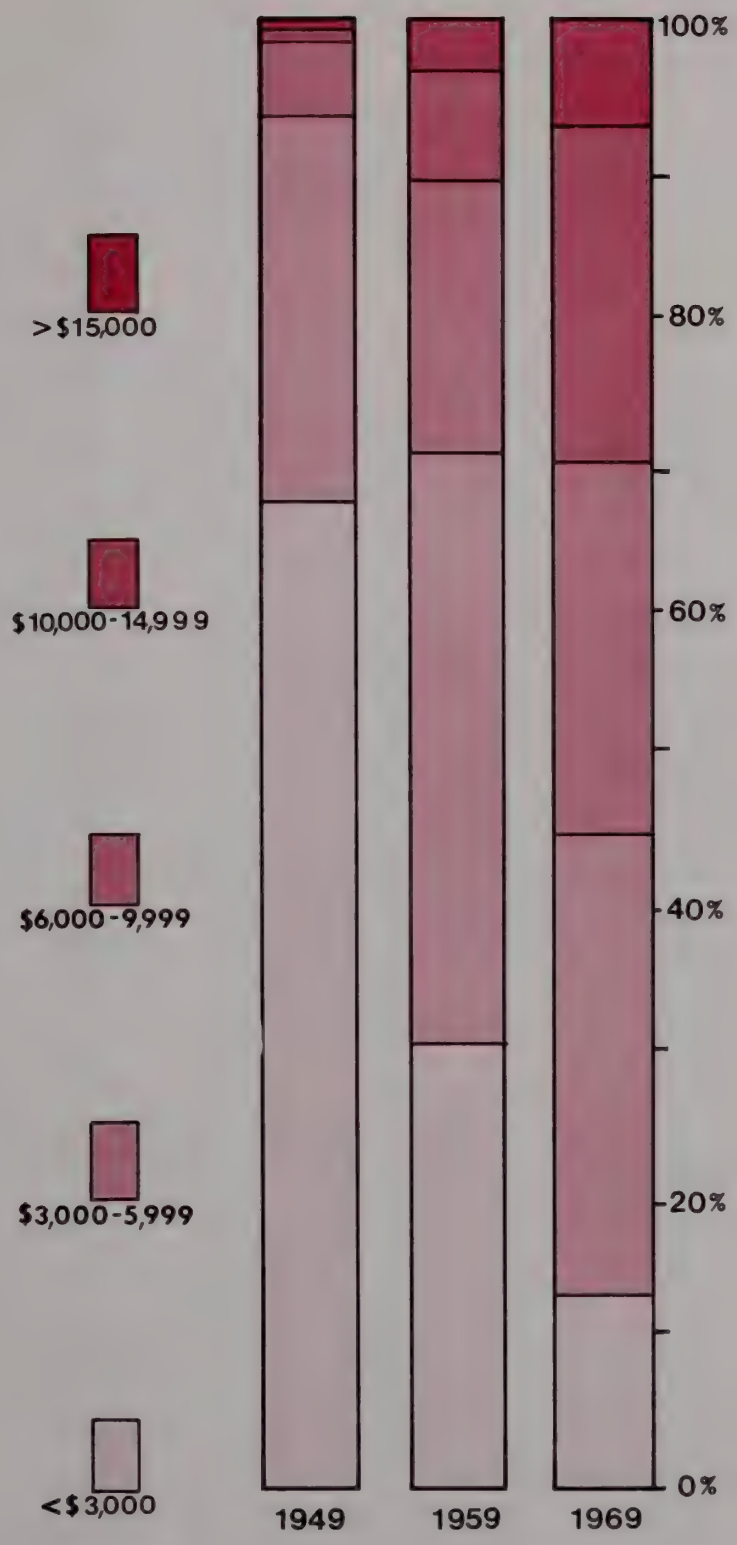
FAMILY INCOME DISTRIBUTION, ALACHUA COUNTY
1949–1969



The preparation of this plate was financed in part through a Comprehensive planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended. Prepared December, 1973, for North Central Florida Regional Planning Council.

FAMILY INCOME DISTRIBUTION ALACHUA COUNTY 1949–1969
WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS

SECTION 6

PUBLIC UTILITIES AND SERVICES

6.1 GENERAL

This section provides a general description of public utilities and services in the county. A description of water and sewer utilities and a plan for their development is presented in detail in subsequent sections and is not included in this background information.

6.2 TRANSPORTATION

With continued population growth occurring within Alachua County, the inherent need for a balanced transportation system should become an increasingly important element in the total transportation planning process of the area. Rising construction costs, physical limitations, and the environmental aspect of providing for adequate roadway and parking facilities for the private automobile will eventually reach the critical stage. It is not the intent of this report to solve transportation problems which may exist in Alachua County, but to give basic background information on existing systems. This section will briefly describe several major aspects of available transportation in the county.

6.2.1 Highway System

Several excellent highways cross Alachua County, generally in a north-south direction. These highways are shown on Plate 6-1. About 36 miles of Interstate 75 lie in Alachua County. This major route is open to traffic from Tampa to Atlanta, Georgia. When completed, it will reach Sault Sainte Marie, Michigan, on the Canadian border. U. S. Highways 441 and 301 provide a total of about 58 miles of four-lane, divided highway in the county. In addition, some short sections (mostly urban) of U. S. Highways 441 and 27 and of State Roads 24, 20, and 26 total over 10 miles more of undivided four-lane roads. There are about 95 miles of two-lane state roads constructed with high type, first class pavement, and more than 338 miles of state roads with other types of bituminous surface. County roads of all types, including some through subdivision reach a total of 850 miles. There is a need for improvement of roads in the east-west direction. These roads carry more local traffic than the main, north-south arteries.

6.2.2 Registered Vehicles

There has been a generally steady increase in the number of registered automobiles since 1957 and the number of trucks has fluctuated but generally increased over the same time period. The Alachua County Automobile Tag Office has reported that a total of 46,000 automobile registrations and 8,250 truck registrations were recorded during the 1973 period.

6.2.3 Commercial Transportation

Two of the main interstate carriers, Greyhound Bus Lines and National Trailways Bus System, cross the county and have stations in Gainesville. In addition to passenger transportation, both lines provide package express service. Greyhound has 33 trips a day entering Gainesville, and Trailways has 15.

Two major railroad companies, the Atlantic Coast Line Railroad Company and Seaboard Air Line Railroad, cross the county. These lines merged in July, 1967, under the name of the Seaboard Coast Line Railroad. Considerable modification has taken place in the last five years both in the amount of active track and the type and amount of service. Plate 6-1 also shows the existing railroad tracks as well as highways in the county. Although passenger service has been reduced due to lessened demand, freight service is presently an active and profitable enterprise.

Gainesville is the only city in the county served by an airline. Eastern Airlines and Florida Airlines have daily flights through Gainesville to points both north and south. Northbound flights connect with Jacksonville and Atlanta, and the southbound with Ocala, Tampa, and Miami. Charter and rental air transport service is also offered at the Gainesville Municipal Airport.

6.3 UTILITY SYSTEMS

6.3.1 Electric Power

Three different companies supply electric power in the county. In addition, the city of Gainesville has its own power generating plants and distribution system, with lines extending over most of the greater Gainesville area. The territory covered by each company is shown on Plate 6-2. Clay Electric Cooperative provides service principally to rural areas and reaches most of the county except localities served by the other two companies or by the city of Gainesville. The Cooperative has approximately 8,500 active electric meters in the county at the present time. Over 90 percent of the farms in the county have electricity.

Florida Power and Light Company serves the corporate areas of Waldo and Hawthorne and some neighboring rural areas. Florida Power Corporation serves customers west of Gainesville, the University of Florida campus, as well as Micanopy, Archer, Newberry, High Springs, Alachua, Hague, and LaCrosse. The cities of Alachua and Newberry have their own distribution systems and they buy the power wholesale from Florida Power Corporation for retail sale to the consumers inside the city limits.

6.3.2 Telephone and Telegraph

Two telephone companies share the county area. Southern Bell Telephone and Telegraph Company operates the larger number of stations, since Gainesville is included in its territory. It also serves Archer, Hawthorne, Micanopy, and Newberry. North Florida Telephone Company operates the Alachua, High Springs, Melrose, and Waldo exchanges.

Even though the territories included in each telephone exchange are not defined by political boundaries, they are usually located in secondary centers of population and growth of the exchanges is directly related to growth of the centers they serve.

Western Union Telegraph Company maintains an office in downtown Gainesville. Their service is available to the entire county by local telephone.

6.3.3 Natural and Bottled Gas

A natural gas transmission line owned by Florida Gas Company crosses the county from north to south passing through the center of the county and the west side of Gainesville. From this line two distribution trunks branch out, one feeding the University of Florida station and the municipal power plant in downtown Gainesville. Distribution from the second trunk is operated by Gainesville Gas Company by lines traversing most of the Gainesville area and extending beyond Interstate 75 to the west. These lines have been extended northwesterly along U. S. 441 into Hague and Alachua. Service is presently available in most of Alachua and the Gainesville urban area and part of Hague. In addition, bottled gas is obtainable in all other areas of the county through at least six distributing companies.

6.3.4 Solid Waste Disposal

Refuse collection services are provided for residents of every incorporated municipality in the county by their respective city governments except for Melrose and Micanopy. The Alachua County Refuse Collection Department (ACRCD) provides collection service upon request to residents of all unincorporated areas of the county as well as Micanopy and that part of Melrose within Alachua County. The two largest institutions in the county, the University of Florida and Sunland Training Center, have their own collection systems and utilize the county landfills for refuse disposal.

Fees, collection methods, and frequency of pickup vary between municipalities; however, adequate collection service with twice a week combined pickup is available to almost all county residents.

Sanitary landfills are utilized as the primary method of refuse disposal in the county. The Alachua County Waste Management Administering Board currently maintains four efficient sanitary landfills which are utilized for disposal of nearly all refuse collected within the county. One landfill is located in each of the four quadrants of the county to facilitate waste disposal.

The North Central Florida Regional Planning Council and the engineering firm of Environmental Science and Engineering, Inc., of Gainesville, Florida, are currently preparing a comprehensive solid waste management study for Alachua County. The report on the first phase of this study describing the physical parameters of all solid waste collection and disposal systems in the county has already been completed. The second phase of this two-year study will culminate in July, 1974, with the completion of a report dealing primarily with the development of a comprehensive solid waste management plan. Copies of this report will be available for study or distribution through the Regional Planning Council office.

6.4 COMMUNITY SERVICES

6.4.1 Medical Services

Table 6-1 is an inventory of health personnel in Alachua County excluding those employed by the University of Florida Medical Center and the Veterans Administration Hospital. This was done in order to more clearly set forth those health providers who are directly available to the citizens of this county. Even though the Medical Center and Veterans Administration Hospital serve some of the local population, at present those statistics are not available.

The information contained in Tables 6-1 and 6-2 was provided by the North Central Florida Health Planning Council who gathered the information for a study on medical scarcity requested by the State Comprehensive Health Planning Bureau in Tallahassee.

Other Health Facilities

Due to the broad scope of the other health facilities in the county, a tabulation is not possible.

The North Central Florida Community Mental Health Center, which serves other counties in addition to Alachua, received 170 patients during September, 1972, and

296 patients during October, 1972, in its out-patient clinic. In-patients by patient days were as follows:

August, 1972 - 154 patient days
September, 1972 - 166 patient days
October, 1972 - 184 patient days

This averages approximately 5 to 6 patients per day. Records are not available prior to those outlined above inasmuch as the Center only became operational in mid-July, 1972.

Alachua General Hospital operates a Well-Baby Clinic. According to the records maintained by the Health Department, this clinic examined 153 children in July, 1972; 129 in August, 1972; 109 in September, 1972; 141 in October, 1972; and 102 in November, 1972.

Health Department

A discussion with Clifford Cole, M.D., former Director of the Alachua County Health Department, revealed that during 1971 there were no diseases reported that were directly associated with polluted water. Statistics for 1972 have not been completed for inclusion in this report. Dr. Cole also reported that the Health Department conducted bacteriological tests on 1,535 samples from 146 private and public wells. His records reflect that the number of individuals served by the 146 wells is approximately 144,000. Other significant contacts made by the Health Department during 1971 included 721 cases of tuberculosis and 71 cases of venereal disease.

Dr. Cole reported the Alachua County Health Department personnel as follows:

1 R.P.S., Director
1 R.P.S., Supervisor
7 Sanitarians
1 Sanitarian Aide

Nursing

1 Director
1 Supervisor
1 T.B. Project Nurse
2 Maternal and Infant Care Project Nurses
1 LPN City Clinic Nurse
9 Public Health Nurses

Dental

1 D.D.S.
1 Dental Assistant

Clerical and Custodial

11 in varying positions

Education Centers

Table 6-1 indicates the specific characteristics of the various educational centers in the county. A close inspection reveals only one school, Santa Fe High School in the city of Alachua, uses its own well as a water source; all others are on public supplies. Of the 37 campus sites in Alachua County, two campuses use septic tanks for sewers, 12 have on-site facilities, and the remainder are served by public sewers.

TABLE 6-1

SUMMARY OF HEALTH PERSONNEL
ALACHUA COUNTY

Type of Practice	Number
General practitioners or family practice	30
Internal medicine	26
Pediatrics	24
OB-Gyn	12
General surgery	21
Psychiatry	7
Other specialties	87
Total	207
Dentists	
General	42
Specialty practice	3
Total Nonfederal Dentists	45
Nurses	
R. N. — Hospital	478
Public health	18
Other	195
L. P. N.— Hospital	175
Other	75
Total Nursing Personnel	941
Other Health Personnel	
Chiropractors	5
Dental hygienists	19
Medical or lab technicians	25
Medical technologists	39
Occupational therapists	8
Optometrists	5
Pharmacists	127

TABLE 6-1 — *Continued*

Other Health Personnel	Number
Physical therapists	35
Radiologic Technicians	37
Veterinarians	17
Total Other Health Personnel	319

Source: Housing Conditions, July 1972.

TABLE 6-2

SUMMARY OF HEALTH FACILITIES
ALACHUA COUNTY

Hospitals	Adult Med. & Surgical	Pediatric	OB	Psychiatric	Other	Total
Alachua General	191	18	25	22	16	272
Shands Teaching	214	69	46	34	18	381
Veterans Administration	368	0	0	90	12	470
North Florida Regional	150	0	0	0	8	158
Total	923	87	71	146	54	1,281

		No. of Beds		
	No.	Extended Care	Long-Term Nursing	Total
Nursing Homes	3	206	93	299

Source: North Central Florida Health Planning Council, 1973.

TABLE 6-3

SUMMARY OF EDUCATION CENTERS
ALACHUA COUNTY

School	Acres	Sewers	Water Source	Average Daily Attendance	Grade Level
Gainesville					
Duval	16	Public	Public	486	5 & 6
J. J. Finley	21	Public	Public	682	K-6
Stephen Foster	19	Public	Public	672	K-4
A. Quinn Jones (Special)	7	Public	Public	-	Adult
Kirby Smith	7	Public	Public	368	K-4
Lake Forest	20	On site	Public	699	K-6
Sidney Lanier	17	Public	Public	519	K-4
Littlewood	15	Public	Public	798	K-4
Metcalfe	17	Public	Public	657	K-4
Williams	20	Public	Public	663	5-6
Lincoln (Special)	53	Public	Public	-	Voc.-Tech.
Howard Bishop	19	Public	Public	1,611	7-8
Westwood	20	Public	Public	1,003	7-8
Gainesville High School	34	Public	Public	2,475	9-12
Myra Terwilliger	27	Public	Public	750	K-4
Idylwild	15	Public	Public	808	K-4
Glen Springs	18	Public	Public	778	K-4
Marjorie Rawlings	-	Public	Public	685	K-6
Eastside	40	On site	Public	1,403	9-12
Buchholz	40	On site	Public	1,176	9-12
Prairie View	20	Public	Public	677	K-6

TABLE 6-3 — *Continued*

School	Acres	Sewers	Water Source	Average Daily Attendance	Grade Level
Alachua					
Alachua Elementary	15	On site	Public	648	K-5
Mebane Middle	39	On site	Public	493	6-8
Santa Fe High School	70	On site	Well	673	9-12
Archer					
Archer Community	15	On site	Public	648	K-6
High Springs					
High Springs Elementary	6	Septic	Public	437	K-4
Spring Hill Middle	25	On site	Public	383	5-8
Hawthorne					
Hawthorne Elementary	15	On site	Public	338	K-5
Shell Middle	10	On site	Public	261	6-8
Hawthorne High School	30	On site	Public	467	9-12
Newberry					
Newberry Elementary	15	Septic	Public	225	K-6
Newberry High School	25	On site	Public	641	7-12
Waldo					
Waldo Community	5	Public	Public	278	K-6
Santa Fe Community College					
East Campus	6	Public	Public	-	-

TABLE 6-3 – *Continued*

School	Acres	Sewers	Water Source	Average Daily Attendance	Grade Level
West Campus	4	Public	Public	-	-
Northwest Campus	100	Public	Public	-	-
North Campus	4	Public	Public	-	-

Source: Alachua County Health Department, 1973 (updated).

COUNTY FACILITIES

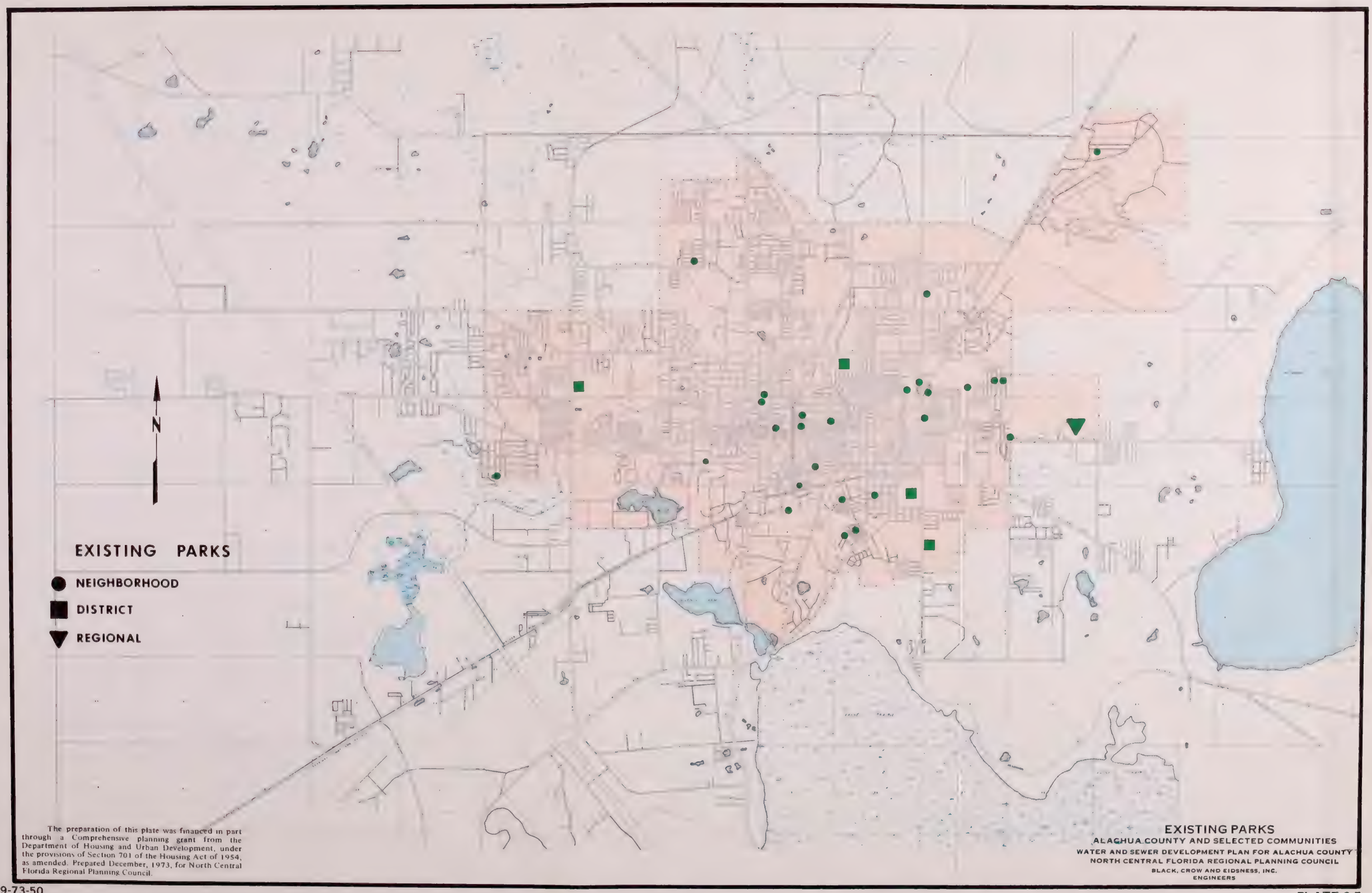
- 1. McCall Park & Ramp
- 2. Watermelon Park & Ramp
- 3. Waldo Park & Ramp
- 4. Lake Altho Park & Ramp
- 5. Santa Fe Lake Park
- 6. Melrose Bay Ramp
- 7. Lake Newnan Park & Ramp
- 8. Newnan East Ramp
- 9. Holden Park & Ramp
- 10. Lochloosa Ramp
- 11. Rawlings Park & Ramp
- 12. River Styx Ramp
- 13. Public Ramp

STATE FACILITIES

- 1. O'Leno Park
- 2. Devil's Milhopper
- 3. Payne's Prairie
- 4. Lake Wauberg

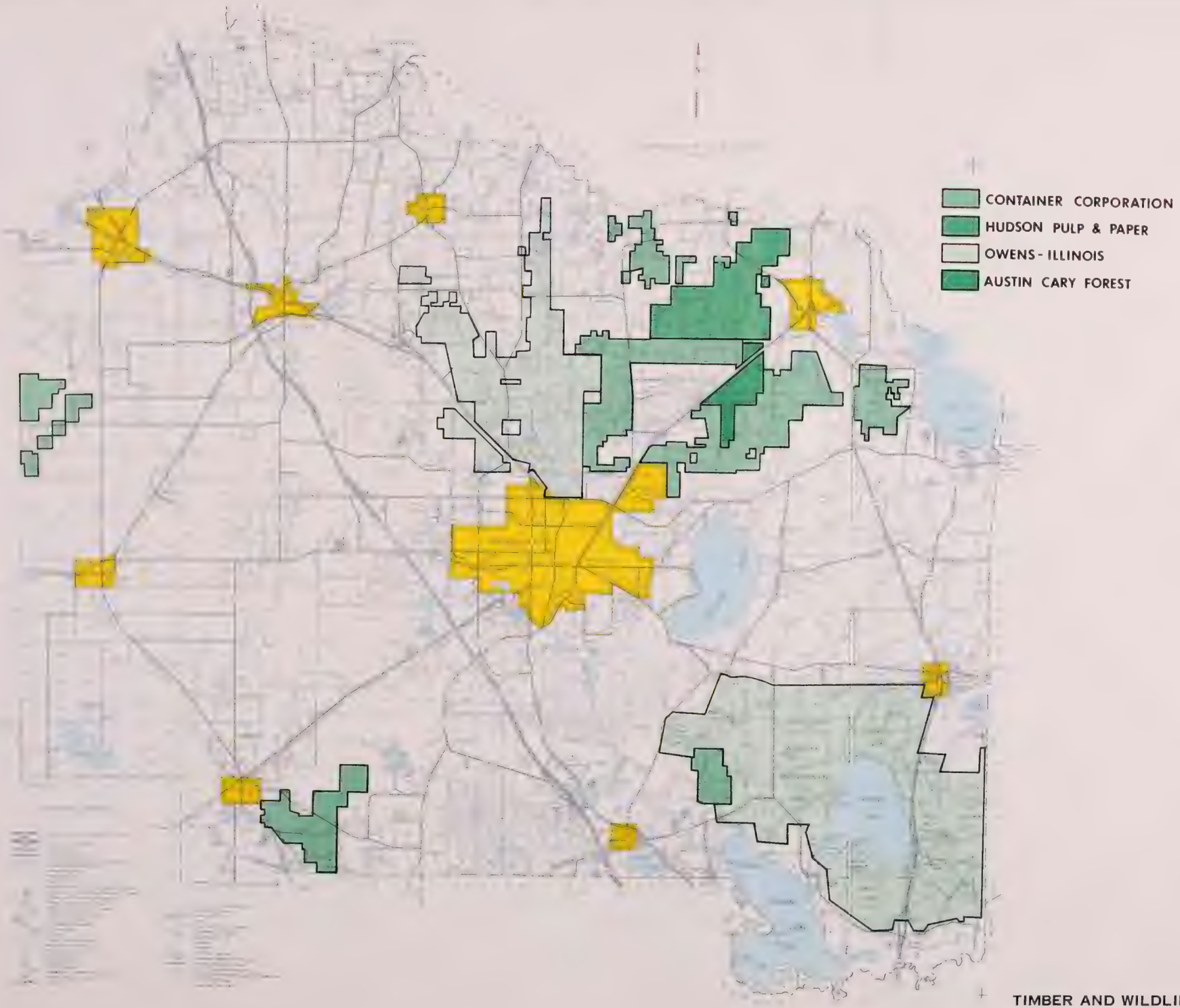
The preparation of this plate was financed in part through a Comprehensive planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended. Prepared December, 1973, for North Central Florida Regional Planning Council

STATE AND COUNTY RECREATIONAL FACILITIES
WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS



The preparation of this plate was financed in part through a Comprehensive planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended. Prepared December, 1973, for North Central Florida Regional Planning Council.

EXISTING PARKS
ALACHUA COUNTY AND SELECTED COMMUNITIES
WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS



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TIMBER AND WILDLIFE MANAGEMENT

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
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SECTION 7

NATURAL RESOURCES

7.1 WATER RESOURCES

7.1.1 General

The water resources of Alachua County are its greatest natural resource. The area is shown to be rich in water resources for domestic, agricultural, and recreational uses. Ample quantities of both surface and groundwaters are limited for these activities primarily by deficiencies in quality. The quality of these water resources stands in jeopardy because of existing and continued degradation. The widespread use of septic tanks, inadequate or incomplete wastewater treatment, and minor amounts of pollution contributed by local industry, local dumps, etc., in combination with high groundwater tables and permeable surface formations often tax the natural purification capabilities of the soil and underlying formations.

Information on water resources includes data on topographic maps, weather records, ground and surface water quantity and quality records, geology, soils, water use, and water pollution. Some of these aspects are covered in other sections of the report. Water quality data for the Alachua County area is available mainly through the Florida Geological Survey, the U. S. Geological Survey, the Florida State Department of Pollution Control, and the Alachua County Health Department.

7.1.2 Surface Water Resources

Two main basins carry surface runoff from the county: the Orange Creek basin to the east and south, and the Santa Fe River basin in the northern part. About one-third of the county's area (in the southwest) has no surface outflow. Streams in this area terminate in sinkholes, leaving the area as underground flow.

Santa Fe River Basin

The Santa Fe River flows along the northern boundary of Alachua County, draining an area extending from three to 15 miles south into the county. The basin covers about 1,440 square miles and discharges into the Suwannee River. Twenty-two percent of this basin (about 315 square miles) is in Alachua County.

Runoff conditions in this basin are very unusual. The upper reaches of the river have flow characteristics showing complete dependence on surface waters. Downstream

of O'Leno State Park, however, numerous springs from porous limestones at or near the surface feed the river.

Numerous sinkholes receive the runoff from smaller streams in about 300 square miles of southwestern Alachua County. As previously noted, this area is not included in any surface water basin. However, groundwater slopes down from this area in a general northwesterly direction toward the Santa Fe River, as indicated by potentiometric contours of the Floridan Aquifer.

Orange Creek Basin

The Orange Creek basin drains into the Oklawaha River, then through the St. Johns River to the Atlantic Ocean. Only the upper two-thirds of this basin (about 515 square miles) is in Alachua County. Flow originates through Hatchet and Little Hatchet creeks which discharge into Newnans Lake east of Gainesville. Overflow from this lake descends through Prairie Creek, Camp's Canal, and River Styx into Orange Lake. A dike and Camp's Canal keep this overflow from entering Paynes Prairie. Lochloosa Creek further east, receives waters from Magnesia Springs and other sources, and drains into Lochloosa Lake which discharges through Cross Creek into Orange Lake. Additional discussion on distribution of streams, lakes, etc., is included in Section 2.6.

7.1.3 Surface Water Uses

Surface waters in the area are used almost entirely for recreational purposes. Because of the availability, quality, and consistency of groundwater, virtually no public water systems rely upon surface waters for their supply. Institutional and industrial users also predominantly utilize groundwater. The limited use of surface waters for irrigation is documented in the Florida Water and Related Land Resources (1970). Table 7-1 summarizes irrigational water use in the county.

7.1.4 Surface Water Quality

Increasing population and growing industry place an ever increasing demand on the water resources of the area. Repeated use of water will affect the chemical quality. Therefore, water quality in surface waters can vary greatly due to manmade as well as natural causes.

In general, surface waters are softer than groundwaters and contain lower amounts of dissolved minerals. On the other hand, surface waters exhibit a higher color and organic content. Quality is variable, but some specific differences can be noted between the two (Santa Fe and Orange) river basins.

Waters from the Santa Fe River become more highly mineralized as they flow downstream, due to groundwater discharging into the stream. For example, the

concentration of dissolved substances at Graham is about twice that of the lakes at the headwaters; and the concentration at High Springs is, on the average, twice that at Graham. The most objectionable characteristic of this water, however, is its very high color, which comes from the swamps upstream from Graham. Graham is located due north of Newnans Lake and just north of the Santa Fe River.

Water in the Orange Creek basin generally has a lower mineral content than that of the Santa Fe River, but during extreme droughts Orange Lake becomes more highly mineralized. The most objectionable qualities of these waters are high color and iron content.

Although water quality data for the area are very limited, a summary of the surface water quality data that has been compiled to date is presented in Table 7-2. A summary of the groundwater quality data is presented in Table 7-3. These data show that the surface waters are generally low in hardness, but high in color and slightly acid. In contrast, the groundwaters are generally hard, but low in color and slightly basic.

All surface waters in the county are considered by the Florida State Department of Pollution Control to be Class III waters and, therefore, suitable for recreation and propagation and management of fish and wildlife. Appendix D describes the water quality standards of Class III waters. Because of limited water quality data, it is not possible to assess the water quality of all receiving streams in the area. However, in the Interim Plan for Water Quality Management, Vicinity of Gainesville, Florida (March, 1972) the Department of Pollution Control describes the character of one of the more important streams in the area, Hogtown Creek. This stream which flows through the western portion of the Gainesville metropolitan area has been the receiving water for industrial waste, untreated wastewater, and urban runoff. The data that has been collected indicates that Hogtown Creek does not meet Class III water quality standards.

In another area of the county one sampling station on the Santa Fe River near U. S. 301 periodically shows water quality to be below Class III standards.

Preliminary water quality data on Sweetwater Branch and Alachua Sink have been gathered and a report on the information presented to the City Commission of Gainesville on February 28, 1973. The report concluded that the quality of flows entering Alachua Sink are not significantly degraded due to the discharge of effluent from the city of Gainesville's wastewater treatment plants No. 1 and 2 into Sweetwater Branch. The water quality data for this report was obtained by a sampling program. This program was undertaken to secure water quality and quantity data in Sweetwater Branch, Bivens Arm, and Paynes Prairie for both dry and wet weather flows. The sampling station locations are shown on Plate 7-1. Data collected during dry and wet weather are summarized in Tables 7-4 and 7-5, respectively. Stations 3 and 4 were monitored during wet weather. Further studies, including a water quality management plan, should be directed to both monitoring and formulating plans for improvement for these and other receiving waters in the county.

7.1.5 Groundwater Resources

Just as surface water quality is influenced by the character of its basin and the quantity and types of influents, so groundwater quality is to a large extent dependent upon the type of formations it passes through, time of residence, and the addition of manmade effluents. Water quality data for the planning area are rather limited. The development of a comprehensive Water Quality Management Plan in the future as required by the Environmental Protection Agency will undoubtedly provide for long-range data collection stations to monitor both ground and surface water quality.

Groundwater is available to the entire county from the Floridan Aquifer and also available in the northern and eastern portions from the upper aquifers. Representative data on groundwater quality are presented in Table 7-3. Almost all rural homes, industries, and municipalities depend upon groundwater for their water supply. This wide use is favored by a usually constant chemical quality and temperature and its relative ease of accessibility.

Many of the smaller water supplies, particularly for rural domestic use, depend upon the upper aquifers. These wells predominantly tap minor artesian aquifers. The water table aquifer apparently is used very little. All the larger users, including most municipalities and the University of Florida, use the Floridan Aquifer.

Groundwater quality varies widely from one aquifer to another and also within the same aquifer. In general, objectionable quality characteristics of the water table aquifer include the presence of iron, and sometimes high color and nitrates. Water from the secondary artesian aquifer is generally harder but less colored than water from the water table aquifer.

The Floridan Aquifer generally produces more water of a better quality than does any other aquifer in Alachua County. Hardness is the most frequent undesirable characteristic and infrequently sulfate or iron waters may be objectionable.

Plate 7-2 shows the dissolved solids and hardness of water from the Floridan Aquifer in the area. As population expands and industry develops in the county groundwater use will rise also. It has been estimated that 4 billion gallons of groundwater were being utilized in 1960. In 1970, considering all uses of groundwater, county consumption was 4.8 billion gallons per year.

7.1.6 Water Pollution Problems

The water resources of the area, as previously mentioned, are its greatest natural resource. Ample quantities of both surface and groundwaters are available, however, they must be protected against deterioration in water quality. The necessary protection can be ensured by the provision of adequate pollution abatement planning and

management. Required uses of the area's waters must be protected against impairment by domestic, industrial, and commerical water quality degradation. Selected problems identifying the general magnitude of pollution are outlined below.

1. Domestic waste disposal is currently the most identifiable pollution problem. Inadequate wastewater treatment facilities are in operation in parts of the county.

   a. Currently the University of Florida is served by a 3.1 mgd treatment facility located on campus which discharges into Lake Alice. Eutrophication of Lake Alice is in evidence throughout the year. The problem is compounded by the fact that the water eventually enters the underground aquifer via drainage wells.

      It is important to point out that even though the University's plant does achieve a high degree of treatment efficiency it has no provision for nutrient removal. In a later section plans for eliminating this source of nutrients are discussed.

   b. The Sunland Training Center is presently served by a 0.5 mgd high rate trickling filter system discharging ultimately into Newnans Lake, a popular sport fishing and recreational lake.

   c. Wastewater from Northwood Subdivision is treated by a package treatment plant of 100,000 gpd capacity which discharges into the headwaters of Hogtown Creek. The Hogtown Creek basin area forms one of the major drainage basins in the area and eventually terminates in Haile Sink which recharges the upper zone of the Floridan Aquifer, a source of water for domestic wells within the county.

   d. The city of Gainesville's two treatment plants discharge effluent into Sweetwater Branch which flows into Paynes Prairie and to Alachua Sink, and ultimately into the upper zone of the Floridan Aquifer. Data indicates that effluent quality improves substantially as it flows through Paynes Prairie to Alachua Sink. In addition, the city operates an extended aeration package wastewater treatment plant at the Gainesville Golf and Country Club. Although designed for flows of 55,000 gallons per day, this unit has been operating at much higher flows. The plant serves those areas outside the city limits to the southwest, and

discharges to lagoons that overflow into Paynes Prairie. Further discussion of elimination of this source will appear in a subsequent section of this report.

e. The city of Waldo is partly sewered, with disposal by means of a septic tank which discharges into the groundwaters of the locale. Due to the generally high water table the soil water conditions are unsatisfactory for proper septic tank operation.

f. Due to lack of wastewater treatment facilities, many areas of the county utilize individual septic tank treatment. Studies in some of these areas have indicated that the soil water table characteristics limit the percolation capabilities and absorption capabilities of drain fields, thus restricting the acceptability and serviceability of septic tanks. Yet it has been estimated by the Alachua County Health Department that in early 1973 about 40 percent of the population were still using septic tanks, including 10 percent to 20 percent of the Gainesville area. (However, the trend toward sewer systems is increasing, since the 1971 estimate for population using septic tanks in the county was 48 percent.) Many additional domestic waste problems could also be cited but it is believed the ones presented portray a cross section of the problems confronting the area at present.

2. Although Alachua County is not classified as an industrial community, various industries scattered throughout the area are contributing, to a degree, to the pollution of the area's waters.

3. Urban and agricultural storm water runoff have accelerated water quality problems in the area. Preliminary studies of the water quality entering the Floridan Aquifer through Haile Sink indicate that during storm runoff, BOD values are consistently higher than under dry weather flow conditions. Furthermore, the COD/BOD ratios suggest that during dry weather, considerable pollution of Hogtown Creek is presently occurring.

Since November, 1971, with the help of the U. S. Geological Survey, water levels at Haile Sink have been recorded to try and determine the sink capacity. This information coupled with stream flow measurements of Hogtown Creek, has shown that the sink capacity is in excess of 100 cfs. The average flows measured in Hogtown Creek to date have been 20 cfs.

Due to the large agricultural base within the county, pasture and farmland have been susceptible to animal wastes. Paynes Prairie, in addition to other large land holdings, has been utilized as grazing land for herds of cattle. Until recently, Paynes Prairie has had up to 2,500 head of cattle on it, contributing pollution equivalent to untreated wastes from a population of 47,500 persons. Runoff from the prairie eventually enters the underground aquifer through Alachua Sink.

Recently, the County Health Department has advised residents surrounding the prairie that tests have shown wells in the vicinity are polluted and that alternate means of acquiring their water should be investigated. If continued use of wells in the area adjoining the prairie is practiced, water should be chlorinated prior to use.

7.1.7 Local Agencies

There are several local agencies that endeavor to limit or abate local pollution sources as part of their work, or are directly involved with local environmental problems concerning water and sewer development.

1. The recently formed Air and Water Pollution Control Board of Alachua County working with the Florida State Department of Pollution Control and sponsored by the Alachua County Commission is actively engaged in building data files on all sources of water and air pollution in the county. Its purpose is to monitor and regulate all pollution-causing activities within its jurisdiction.

2. The Alachua County Health Department contributes substantially to environmental control by monitoring public water supply quality, authorizing septic tanks, and other related activities. This agency is vitally important in maintaining a quality environment in the county, and the large amount of data accumulated on water quality, etc., would be very useful if a water quality management plan were to be compiled for the area.

3. The Waste Management Administering Board of Alachua County is responsible for operating and maintaining sanitary landfills within the county. At the present, four landfills are currently in operation. These four sanitary landfills should be of sufficient size and strategic location to adequately serve the disposal needs of the entire county.

4. The Gainesville-Alachua County Regional Electric, Water and Sewer Utilities Board is now responsible for the regulation and development

of the named utilities. This board therefore exerts a strong influence on community development as well as water and sewer projects.

The community has much to gain from the continued cooperation and exchange of information and expertise between these agencies. Increased coordination in all related activities should be encouraged.

7.1.8 Water Quality Projects

Pollution abatement and management are an integral part of any pollution control program. The lack of a unified management approach to the problem of pollution has resulted in futile attempts to solve the problem. As frequently evidenced in the past, urban growth and associated problems almost always approach a crisis prior to the formulation of adequate federal, state, regional, and local programs as well as development policies for guiding and financing the necessary planning. Preliminary plan elements dealing with the abatement of water pollution have been completed for Alachua County. However, these plan elements are not comprehensive enough to deal as required with water degradation and the resulting problems.

These existing plan elements and ones being developed herein are designed primarily to meet HUD Water and Sewer System Planning Program Requirements. Hence, these plan elements, when completed, only relate to the efficient and effective collection and management of municipal waste systems without ample regard for the effects that municipal waste or other wastes (i.e., industrial, and runoff from agricultural, and urban development) may have upon the quality of the receiving waters.

The Regional Planning Council therefore still encourages the compilation of a comprehensive water quality management plan for Alachua County such as that provided for under 3(c) of PL 84-660 of the Federal Water Pollution Control Act. This plan would utilize engineering data to define water quality goals and outline alternative plans for the effective utilization and protection of ground and surface water resources.

TABLE 7-1

IRRIGATION WATER USE
ALACHUA COUNTY

	Citrus		Pasture		Truck	
	Wells	Surface	Wells	Surface	Wells	Surface
Irrigation Water Supplied (1965) (1,000 Acre-feet)	-	100	-	-	0.1	0.5
Projected Irrigation Needs by 2020 (1,000 Acre-feet)	0.2	0.1	-	-	2.2	2.2

Source: Florida Water and Related Land Resources, St. Johns River Basin, 1970.

TABLE 7-2

AVERAGE, MAXIMUM, MINIMUM VALUES, OBSERVED FOR SUBSTANCES DISSOLVED IN STREAMS AND LAKES

Chemical analyses in parts per million, July 1957 to September 1960 except as otherwise stated

	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Sum of determined mineral constituents	Residue in evaporation at 180°C	Approximate organic matter (solids-sum)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
																	Calcium, magnesium	Non-carbonate			
SANTA FE LAKE NEAR MELROSE—Semi-annual																					
Average	76	1.6	0.08	2.3	1.2	7.3	0.4	4	4.2	12	0.1	0.3		32	44	13	11	8	62	5.7	26
Maximum	88	6.0	.09	3.0	1.7	7.8	.6	6	7.5	13	.1	1.0		38	54	18	12	10	65	6.0	45
Minimum	60	.0	.06	1.4	.6	6.8	.1	2	1.6	12	.0	.0		28	33	5	9	6	59	5.3	10
LITTLE SANTA FE LAKE NEAR MELROSE—Semi-annual																					
Average	70	2.8		3.8	1.2	6.7	.2	10	2.8	12	.1	.1		34	56	22	14	6	68	6.0	58
Maximum	85	7.5		8.4	1.7	7.8	.4	25	5.0	12	.2	.2		49	72	33	28	8	92	7.1	65
Minimum	54	.4		2.0	1.0	6.0	.1	4	.0	11	.0	.0		25	42	15	9	5	56	5.4	50
SANTA FE RIVER AT GRAHAM—6-8 week intervals																					
Average		3.5	.38	3.3	1.9	5.2	.4	9	2.5	9.8	.2	.4		32	93	61	16	9	60	5.4	275
Maximum		8.6	.76	12	4.6	7.5	.8	44	8.8	16	.5	.7		73	138	99	49	14	120	6.4	500
Minimum		.3	.18	1.2	.5	2.0	.0	0	.4	3.5	.1	.1		13	44	22	7	0	30	4.4	180
HATCHET CREEK NEAR CONFLUENCE OF SANTA FE RIVER NEAR GRAHAM—Semi-annual																					
Average	66	4.4	.33	3.9	1.5	3.6	.3	13	1.8	7.1	.2	.2		30	59	38	16	5	57	5.4	154
Maximum	78	9.2	.42	13	4.5	4.7	.9	55	3.5	9.5	.3	.5		70	76	56	51	8	115	6.9	280
Minimum	54	1.8	.25	.4	.4	2.0	.0	0	.4	2.5	.1	.0		8	42	21	2	2	29	4.3	80
ROCKY CREEK NEAR LaCROSS—Semi-annual																					
Average	65	7.1	.82	7.4	2.8	5.6	1.5	22	6.0	12	.4	.0		54	86	32	30	12	90	6.3	101
Maximum	74	9.6	1.6	10	5.0	8.7	2.4	43	9.0	18	.4	.1		80	111	52	44	18	126	7.3	130
Minimum	55	3.4	.31	2.8	.9	2.9	.1	4	2.8	5.5	.2	.0		22	49	11	10	5	41	5.5	45
SANTA FE RIVER AT HIGH SPRINGS*																					
Average	69	11	0.30	39	5.7	7.3	0.6	100	36	12	.3	.4		157	193	36	123	42	268	7.2	117
Maximum	80	20	.56	66	10	10	1.0	168	69	16	.4	1.3		260	299	62	206	70	432	8.3	280
Minimum	60	3.9	.11	6.0	1.0	3.3	.0	16	4.8	3.0	.0	.0		32	62	0	19	6	57	6.4	5

*Daily October 1959 to September 1960, 6-8 week intervals July 1957 to September 1959.

TABLE 7-2 – *Continued*

	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Sum of determined mineral constituents	Residue in evaporation at 180°C	Approximate organic matter (solids-sum)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Non-carbonate	Specific conductance (micromhos at 25°C)	pH	Color
NEWNANS LAKE NEAR GAINESVILLE--Semi-annual																					
Average	71	1.7	.38	4.0	1.3	5.4	.6	11	2.3	7.9	.2	1.0	.0	29	64	37	15	7	61	5.9	80
Maximum	88	3.0	.65	5.6	1.7	9.0	1.0	21	3.2	14	.3	4.4	.1	45	76	41	21	9	86	6.6	110
Minimum	55	.1	.14	3.2	.9	3.8	.0	4	1.2	2.5	.2	.0	.0	21	53	31	12	4	49	5.3	50
CAMPS CANAL NEAR ROCHELLE—Semi-annual																					
Average	69	1.9	.38	3.8	1.0	4.6	.2	8	2.5	8.2	.2	1.6	.2	28	52	19	13	7	55	5.7	85
Maximum	84	2.6	.66	4.4	1.1	5.2	.5	10	4.8	10	.2	4.5	.5	32	64	38	15	9	63	5.9	110
Minimum	55	1.1	.08	3.2	.7	3.9	.0	4	.8	5.8	.1	.0	.0	24	29	5	12	4	48	5.5	60
LOCHLOOSA CREEK AT GROVE PARK—Semi-annual																					
Average	67	6.4	.23	3.6	1.9	5.1	.4	9	1.5	8.5	.2	.2	.4	32	74	42	17	9	58	5.7	177
Maximum	83	11	.40	4.4	2.7	7.1	.9	14	2.4	12	.3	.3	.7	47	92	45	22	12	78	6.1	220
Minimum	58	2.2	.07	2.0	1.0	3.8	.0	4	.4	5.0	.2	.1	.0	17	60	39	9	6	40	5.4	150
LAKE LOCHLOOSA NEAR LOCHLOOSA—Semi-annual																					
Average	70	1.7	.26	12	2.6	6.6	0.5	37	7.0	12	0.2	0.6	0.6	63	77	21	40	9	112	6.7	45
Maximum	85	5.7	.56	15	3.3	7.8	1.0	50	12	16	.3	1.0	1.1	84	91	30	51	12	142	6.8	75
Minimum	59	.0	.06	8.0	1.7	5.8	.1	29	3.2	10	.2	.0	.0	44	49	5	29	5	83	6.6	15
ORANGE LAKE AT HEAGEY'S FISHING CAMP—Semi-annual																					
Average	69	1.4	.13	6.9	1.3	5.4	.6	20	2.0	8.8	.2	.4		37	57	20	23	6	71	6.4	52
Maximum	83	2.0	.16	7.6	1.7	6.3	.9	20	2.4	10	.3	.8		39	67	28	24	7	79	6.5	65
Minimum	58	.7	.10	6.0	1.1	4.8	.1	20	1.2	7.5	.2	.2		34	46	8	22	6	65	6.4	45
ORANGE LAKE NEAR BOARDMAN—Semi-annual																					
Average	73	3.3	.20	6.3	1.6	4.6	.4	20	1.9	8.4	.2	.8		37	58	23	22	6	71	6.4	62
Maximum	83	4.3	.23	6.8	1.9	4.7	.8	21	3.0	10	.3	1.3		42	66	30	25	8	83	6.5	80
Minimum	59	2.3	.16	6.0	1.2	4.6	.1	18	.8	7.0	.1	.2		33	49	16	20	4	61	6.3	50

Source: Data from Clark et al., 1964a.

1-73-50

TABLE 7-3

CHEMICAL ANALYSES AND TEMPERATURE OF GROUND WATERS

Chemical analyses in parts per million except specific conductance, pH, and color

Well number	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids: Calculated	Dissolved solids: Residue at 180°C	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color	Temperature (°F)
ALACHUA COUNTY																					
Water-table aquifer																					
93021604	07-27-60	10	0.15	9.2	1.9	--	--	30	5.2	9.0	0.4	0.1	--	57	--	31	6	109	7.0	--	76
93322301	07-27-60	6.0	6.4	3.6	1.2	3.2	0.6	13	4.0	6.5	.1	.2	0.1	33	40	14	4	48	6.6	200	76
93621201	07-14-60	.6	.02	4.8	.9	--	--	18	--	--	.8	--	--	40	--	16	0	74	6.8	--	--
93721201	07-14-60	15	1.1	29	12	--	--	132	2.0	--	.6	--	--	143	--	122	14	252	7.9	--	73
93721201	07-27-60	15	.73	28	17	--	--	140	2.8	12	.6	--	--	173	--	140	26	257	8.0	--	73
94121001	07-14-60	15	.02	23	9.8	--	--	120	--	--	.4	--	--	117	--	98	0	215	7.6	--	75
94121102	07-14-60	19	.01	37	16	--	--	186	3.2	14	.4	.0	--	190	--	158	6	336	7.8	--	71
94220701	07-26-60	8.8	.66	2.8	2.7	13	.5	19	13	24	.2	.2	.2	74	111	18	2	144	6.6	140	80
94222101	07-28-60	3.6	.50	1.6	.7	8.0	.4	4	5.6	8.0	.4	1.4	.0	32	79	7	4	62	5.5	550	79
94321501	07-19-60	2.2	3.8	11	.9	--	--	33	--	--	.1	--	--	59	--	31	4	99	6.8	--	76
94621801	07-26-60	8.0	.10	13	6.2	26	29	12	16	61	.3	37	--	202	238	58	48	357	6.6	2	1
94622601	07-26-60	43	.16	5.2	1.5	6.5	.1	7	4.0	7.5	.1	16	.2	49	57	19	14	78	6.3	--	74
94721003	08-15-60	22	.04	44	18	--	--	228	--	--	.3	--	--	200	--	184	0	374	7.4	--	74
94921101	07-27-60	7.6	.55	3.2	2.9	20	.2	9	--	24	.0	14	--	88	--	20	12	143	6.4	--	75
94921401	07-27-60	4.1	.19	4.4	1.2	6.1	.8	16	6.4	6.0	.1	.9	.1	38	46	16	3	64	6.5	20	82
95021302	08-16-60	31	.78	38	13	--	--	186	--	--	.3	--	--	183	--	148	0	312	8.2	--	74
95022001	07-26-60	7.8	1.6	3.6	1.3	--	--	11	--	9.5	.3	.2	--	--	--	14	6	57	6.7	--	74
95122401	07-26-60	5.5	.35	5.2	2.7	3.9	.1	15	15	7.5	.5	.7	--	48	65	24	12	88	6.6	0	80
Secondary artesian aquifer																					
93021401	07-27-60	12	0.03	50	22			254	9.2	--	0.5	--		239		216	8	428	8.0		76
93220501	07-14-60	33	1.9	45	7.7			182	--	--	.8	--		201		144	0	409	8.1		76
93520403	07-14-60	9.[illegible]	.04	15	6.9			76	--	--	.5	--		76		66	4	142	7.2		79
93520404	07-14-60	12	.12	14	4.6			55	--	--	.5	--		68		54	9	110	7.1		79
93520601	07-14-60	15	.07	48	24			256	--	--	.3	--		232		218	0	424	8.3		86
93520701	07-14-60	41	.11	9.[illegible]	7.3			59	--	--	.7	--		98		54	6	115	7.1		79
93820801	07-14-60	42	.19	34	13			162	3.6	--	.5	--		193		138	6	288	8.0		--
93920402	07-15-60	25	.12	32	6.1			123	2.4	--	.6	--		146		105	4	226	7.1		80
93921501	07-15-60	32	.07	27	6.4			114	--	--	.5	--		141		94	0	201	7.8		--
93921601	07-20-60	17	.28	34	10			156	--	--	.6	--		151		126	0	259	8.1		78

TABLE 7-3 — *Continued*

Chemical analyses in parts per million except specific conductance, pH, and color

Well number	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids: Calculated	Dissolved solids: Residue at 180°C	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color	Temperature (°F)
Secondary artesian aquifer																					
93922001	07-20-60	12	0.87	36	14			180	--	--	0.6	--		180		148	0	303	8.2		83
94021101	07-14-60	11	.02	30	13			156	--	--	.4	--		141		128	0	258	7.5		78
94021401	07-19-60	30	.21	50	17			240	--	--	.6	--		243		195	0	412	7.6		78
94021402	07-19-60	30	.30	52	17			246	--	--	.5	--		251		200	0	407	8.0		76
94021801	07-20-60	17	.11	49	20			252	--	--	.8	--		226		204	0	399	7.8		76
94021904	07-21-60	1.5	.17	22	11			124	--	--	.6	--		114		100	0	225	7.8		79
94022001	07-20-60	17	.22	25	10			128	--	--	.5	--		127		104	0	220	7.8		81
94022002	07-20-60	15	.07	22	11			116	--	--	.6	--		114		100	5	195	7.7		81
94120501	07-15-60	12	.03	6.8	1.9			26	1.2	16	.8	--		63		25	4	100	6.8		82
94220601	07-15-60	24	.03	38	23			214	4.0	--	.5	0.1		219		190	14	365	7.7		80
94221001	07-14-60	49	.04	17	8.6			89	1.2	--	.5	--		133		78	5	168	7.3		73
94320801	07-19-60	26	.08	41	11			178	--	--	.5	--		190		148	2	310	7.7		76
94420501	07-15-60	23	.03	32	18			188	--	--	.5	--		189		154	0	328	7.8		83
94420601	07-15-60	24	.03	37	15			186	--	--	.6	--		182		154	2	318	7.8		79
94621001	07-28-60	12	.10	46	23			250	--	--	.4	--		230		210	4	415	8.0		75
94721002	07-28-60	11	.06	49	21	1[illegible]	0.9	234	6.8	24	.4	6.3		249		209	17	453	8.0		74
94721007	08-15-60	15	.02	43	22			242	--	--	.5	--		224		198	0	400	7.6		72
94920801	07-27-60	16	.05	41	18			204	2.8	--	.3	--		202		176	10	344	8.2		82
95021001	08-16-60	13	.06	42	21			232	--	--	.2	--		221		192	2	385	8.1		76
Floridan aquifer																					
92720301	07-26-60	15	0.05	54	5.4	--	--	196	--	--	0.2	--	--	193	--	157	0	325	7.9	--	74
92920401	07-26-60	9.5	.31	14	2.4	16	8.9	30	25	20	.4	4.1	1.3	117	144	45	20	192	6.9	140	82
92920901	07-14-60	24	--	53	9.7	--	--	210	--	--	.3	--	--	209	--	172	0	347	8.1	--	76
92921301	07-27-60	20	.29	74	9.6	--	--	250	6.4	--	.3	--	--	252	--	221	19	354	8.2	--	76
92921401	07-27-60	17	.04	110	21	35	.7	312	6.0	126	.5	2.9	--	473	--	361	106	836	8.0	--	78
93020501	07-14-60	21	.89	67	10	--	--	254	--	--	.3	--	--	254	--	208	0	421	8.0	--	78
93020601	07-14-60	17	.07	54	11	--	--	218	--	--	.3	--	--	215	--	180	1	361	8.0	--	76
93020602	07-14-60	25	.03	66	16	--	--	280	--	--	.3	--	--	265	--	230	1	445	8.1	--	82
93020603	07-14-60	23	.12	34	11	--	--	230	--	--	.6	--	--	231	--	130	2	371	7.9	--	81
93021601	07-28-60	32	2.5	69	7.5	--	--	244	--	--	.7	--	--	238	--	202	2	382	8.2	--	74
93021602	07-27-60	18	.13	67	4.1	--	--	224	--	--	.4	--	--	224	--	184	0	364	8.2	--	76
93021702	07-13-60	6.7	.02	52	3.5	--	--	172	--	--	.3	--	--	171	--	144	3	290	7.9	--	75
93121802	07-13-60	11	.32	46	5.1	8.5	1.6	157	2.4	16	.3	.5	.6	169	196	136	8	293	7.9	70	--
93121901	07-13-60	16	.66	75	5.1	19	.6	252	3.6	38	.4	.1	--	289	--	208	2	501	8.2	--	82
93221501	07-28-60	14	.92	65	2.4	--	--	208	--	--	.3	--	--	206	--	172	2	339	8.2	--	74
93222201	07-27-60	12	7.3	105	5.8	--	--	308	--	--	.3	--	--	330	--	285	20	551	8.3	--	74
93223101	07-28-60	6.2	.05	53	2.4	--	--	168	--	--	.2	--	--	170	--	142	4	287	8.0	--	78
93320601	07-14-60	17	.28	47	8.9	--	--	180	--	--	.4	--	--	185	--	154	6	303	8.1	--	77
93321901	07-28-60	47	.92	101	9.5	2[illegible]	.8	142	6.8	32	.7	.1	--	385	--	291	18	651	8.4	--	74

TABLE 7-3 — *Continued*

Chemical analyses in parts per million except specific conductance, pH, and color

Well number	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids: Calculated	Dissolved solids: Residue at 180°C	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color	Temperature (°F)
Secondary artesian aquifer																					
93922001	07-20-60	12	0.87	36	14			180	--	--	0.6	--		180		148	0	303	8.2		83
94021101	07-14-60	11	.02	30	13			156	--	--	.4	--		141		128	0	258	7.5		78
94021401	07-19-60	30	.21	50	17			240	--	--	.6	--		243		195	0	412	7.6		78
94021402	07-19-60	30	.30	52	17			246	--	--	.5	--		251		200	0	407	8.0		76
94021801	07-20-60	17	.11	49	20			252	--	--	.8	--		226		204	0	399	7.8		76
94021904	07-21-60	1.5	.17	22	11			124	--	--	.6	--		114		100	0	225	7.8		79
94022001	07-20-60	17	.22	25	10			128	--	--	.5	--		127		104	0	220	7.8		81
94022002	07-20-60	15	.07	22	11			116	--	--	.6	--		114		100	5	195	7.7		81
94120501	07-15-60	12	.03	6.8	1.9			26	1.2	16	.8	--		63		25	4	100	6.8		82
94220601	07-15-60	24	.03	38	23			214	4.0	--	.5	0.1		219		190	14	365	7.7		80
94221001	07-14-60	49	.04	17	8.6			89	3.2	--	.5	--		133		78	5	168	7.3		73
94320801	07-19-60	26	.08	41	11			178	--	--	.5	--		190		148	2	310	7.7		76
94420501	07-15-60	23	.03	32	18			188	--	--	.5	--		189		154	0	328	7.8		83
94420601	07-15-60	24	.03	37	15			186	--	--	.6	--		182		154	2	318	7.8		79
94621001	07-28-60	12	.10	46	23			250	--	--	.4	--		230		210	4	415	8.0		75
94721002	07-28-60	11	.06	49	21	15	0.9	234	6.8	14	.4	6.3		249		209	17	453	8.0		74
94721007	08-15-60	15	.02	43	22			242	--	--	.5	--		224		198	0	400	7.6		72
94920801	07-27-60	16	.05	41	18			204	2.8	--	.3	--		202		176	10	344	8.2		82
95021001	08-16-60	13	.06	42	21			232	--	--	.2	--		221		192	2	385	8.1		76
Floridan aquifer																					
92720301	07-26-60	15	0.05	54	5.4	--	--	196	--	--	0.2	--	--	193	--	157	0	325	7.9	--	74
92920401	07-26-60	9.5	.31	14	2.4	16	8.9	30	25	20	.4	4.1	1.3	117	144	45	20	192	6.9	140	82
92920901	07-14-60	24	--	53	9.7	--	--	210	--	--	.3	--	--	209	--	172	0	347	8.1	--	76
92921301	07-27-60	20	.29	74	9.6	--	--	250	6.4	--	.3	--	--	252	--	221	19	354	8.2	--	76
92921401	07-27-60	17	.04	110	21	35	.7	312	6.0	126	.5	2.9	--	473	--	361	106	836	8.0	--	78
93020501	07-14-60	21	.89	67	10	--	--	254	--	--	.3	--	--	254	--	208	0	421	8.0	--	78
93020601	07-14-60	17	.07	54	11	--	--	218	--	--	.3	--	--	215	--	180	1	361	8.0	--	76
93020602	07-14-60	25	.03	66	16	--	--	280	--	--	.3	--	--	265	--	230	1	445	8.1	--	82
93020603	07-14-60	23	.12	34	11	--	--	230	--	--	.6	--	--	231	--	130	2	371	7.9	--	81
93021601	07-28-60	32	2.5	69	7.5	--	--	244	--	--	.7	--	--	238	--	202	2	382	8.2	--	74
93021602	07-27-60	18	.13	67	4.1	--	--	224	--	--	.4	--	--	224	--	184	0	364	8.2	--	76
93021702	07-13-60	6.7	.02	52	3.5	--	--	172	--	--	.3	--	--	171	--	144	3	290	7.9	--	75
93121802	07-13-60	11	.32	46	5.1	8.5	1.6	157	2.4	16	.3	.5	.6	169	196	136	8	293	7.9	70	--
93121901	07-13-60	16	.66	75	5.1	19	.6	252	3.6	38	.4	.1	--	289	--	208	2	501	8.2	--	82
93221501	07-28-60	14	.92	65	2.4	--	--	208	--	--	.3	--	--	206	--	172	2	339	8.2	--	74
93222201	07-27-60	12	7.3	105	5.8	--	--	308	--	--	.3	--	--	330	--	285	20	551	8.3	--	74
93223101	07-28-60	6.2	.05	53	2.4	--	--	168	--	--	.2	--	--	170	--	142	4	287	8.0	--	78
93320601	07-14-60	17	.28	47	8.9	--	--	180	--	--	.4	--	--	185	--	154	6	303	8.1	--	77
93321901	07-28-60	47	.92	101	9.5	22	.8	142	6.8	32	.7	.1	--	385	--	291	18	651	8.4	--	74

TABLE 7-3 — *Continued*

Chemical analyses in parts per million except specific conductance, pH, and color--Continued

Well number	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids: Calculated	Dissolved solids: Residue at 180°C	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25 C)	pH	Color	Temperature (°F)
ALACHUA COUNTY--Continued																					
Floridan aquifer--Continued																					
93323201	07-27-60	--	0.09	--	--	--	--	182	--	--	--	--	--	--	--	--	--	326	8.0	--	77
93520402	07-27-60	14	.07	44	4.4	--	--	154	--	--	0.3	--	--	160	--	128	2	260	8.0	--	82
93520901	07-14-60	32	.08	14	4.4	--	--	36	5.2	13	.9	8.5	--	104	--	53	24	140	6.8	--	79
93521101	07-14-60	34	.21	50	12	--	--	212	--	--	.5	--	--	220	--	174	1	345	8.2	--	76
93521302	07-14-60	7.5	.03	35	1.6	--	--	84	4.0	12	.4	33	--	146	--	94	25	260	7.8	--	78
93522001	07-20-60	11	2.3	138	3.3	20	1.2	422	.8	33	.1	.6	--	420	443	358	6	718	8.3	--	81
93522002	07-20-60	9.1	.07	117	2.4	--	--	340	--	--	.3	--	--	340	--	302	4	583	8.4	--	82
93522003	07-20-60	9.0	1.5	118	6.6	--	--	358	1.2	--	.2	--	--	359	--	322	15	601	8.3	--	81
93522101	07-28-60	17	.03	130	3.8	31	.4	356	13	67	.3	--	--	438	--	340	48	783	8.1	--	74
93522501	07-27-60	7.0	.05	89	1.5	--	--	270	6.0	6.5	.2	--	--	264	--	228	12	450	8.2	--	78
93620701	07-14-60	24	.06	44	12	--	--	194	--	--	.5	--	--	194	--	160	0	330	8.1	--	81
93622001	07-21-60	2.4	.04	12	.7	14	.5	21	2.0	30	.2	.6	0.1	73	96	33	16	146	6.5	--	79
93622003	07-20-60	11	.13	92	1.6	--	--	278	12	--	.2	--	--	281	--	236	8	471	8.1	--	84
93623602	07-28-60	6.5	.02	34	1.2	--	--	103	5.2	--	.2	--	--	118	--	90	6	184	7.2	--	--
93721202	07-19-60	14	.03	37	20	--	--	192	.8	6.5	.6	--	--	176	--	174	17	315	8.0	--	81
93721601	07-19-60	49	.05	13	2.1	--	--	46	--	15	1.5	.1	--	124	--	41	4	148	7.1	--	78
93721701	07-19-60	18	.05	58	6.7	--	--	204	--	--	.4	--	--	211	--	172	5	348	8.0	--	78
93722201	08-16-60	7.5	.02	44	.7	3.7	.1	137	2.8	2.5	.1	.9	--	130	132	113	0	234	7.5	--	74
93722301	08-16-60	19	--	78	4.7	--	--	248	6.4	--	.2	--	--	292	--	124	11	407	8.1	--	78
93723201	07-29-60	9.1	.01	42	2.7	--	--	136	--	--	.2	--	--	131	--	116	4	227	7.8	--	74
93820601	07-14-60	21	.17	34	21	--	--	196	2.0	--	.6	--	--	189	--	172	11	324	8.1	--	84
93821101	07-14-60	51	.09	34	8.0	--	--	134	3.6	--	1.0	--	--	177	--	118	8	236	7.9	--	74
93821102	07-14-60	1.7	.03	7.6	1.5	--	--	30	--	--	.5	--	--	38	--	25	0	72	7.0	--	--
93821103	07-14-60	45	.02	34	11	--	--	156	--	--	.9	--	--	188	--	130	2	272	8.1	--	--
93821601	07-19-60	25	.04	53	14	--	--	222	12	--	.4	--	--	236	--	190	8	388	8.2	--	82
93821701	07-20-60	14	.02	12	5.8	--	--	60	--	--	.4	--	--	68	--	54	5	119	7.2	--	80
93821702	07-19-60	22	.06	48	10	--	--	184	9.2	10	.4	--	--	198	--	161	10	336	7.5	--	80
93821901	07-20-60	22	.07	54	15	--	--	216	22	--	.5	--	--	244	--	196	19	400	8.2	--	74
93821902	07-20-60	20	.08	82	8.1	--	--	280	4.0	--	.3	--	--	300	--	238	8	483	8.2	--	74
93821903	07-20-60	9.9	.17	36	4.9	10	1.1	128	8.8	11	.4	0.4	1.3	147	175	110	5	255	8.0	75	74
93821904	08-16-60	10	.04	18	5.4	11	1.2	50	21	19	.5	.2	--	111	--	67	26	193	7.4	--	76
93821906	07-20-60	16	.11	46	7.5	7.2	.8	171	10	10	.4	.2	.8	183	200	146	6	309	8.2	45	76
93822301	08-16-60	8.9	.20	78	.4	--	--	218	7.6	--	.3	--	--	233	--	196	18	406	8.2	--	78
93822303	08-16-60	22	.03	70	.9	--	--	212	--	--	.3	--	--	228	--	178	4	364	8.0	--	74

19-73-50

TABLE 7-3 — *Continued*

Chemical analyses in parts per million except specific conductance, pH, and color--Continued

Well number	Date of collection	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids: Calculated	Dissolved solids: Residue at 180°C	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color	Temperature (°F)
ALACHUA COUNTY--Continued																					
Floridan aquifer--Continued																					
93823401	07-29-60	16	.02	147	37	20	2.4	188	344	16	.6	.6	.0	687	743	519	65	983	8.1	--	78
93823402	07-29-60	7.7	.01	52	3.0	--	--	170	--	--	.2	--	--	163	--	142	2	277	8.1	--	78
93823501	07-29-60	6.5	.02	52	2.6	--	--	162	--	--	.2	--	--	159	--	140	7	273	8.1	--	74
93823601	07-29-60	6.1	.02	51	2.7	--	--	162	--	--	.2	--	--	160	--	138	5	273	8.0	--	74
93823602	08-29-60	5.6	.02	50	3.6	--	--	156	5.2	--	0.2	--	--	156	--	140	12	269	8.1	--	74
93823701	07-29-60	5.9	.02	50	3.2	--	--	162	--	--	.2	--	--	154	--	138	5	268	8.0	--	71
93921902	07-20-60	26	.08	50	18	--	--	220	19	11	.4	--	--	245	--	199	18	410	8.2	--	79
93922101	08-15-60	8.1	.07	55	5.6	--	--	192	--	--	.3	--	--	190	--	160	2	329	8.2	--	80
93922102	08-15-60	12	.07	82	3.8	--	--	256	7.6	--	.3	--	--	263	--	220	10	440	8.1	--	79
93922301	08-15-60	9.6	.04	45	.0	--	--	134	--	--	.3	--	--	150	--	112	2	240	7.4	--	82
93922302	08-15-60	9.4	.10	49	.9	--	--	150	--	--	.2	--	--	161	--	126	3	263	7.6	--	81
93922303	08-15-60	11	.03	50	.7	--	--	160	--	--	.3	--	--	161	--	128	0	264	7.7	--	79
93922501	08-16-60	13	.04	63	1.2	--	--	192	--	--	.3	--	--	204	--	162	4	333	7.8	--	79
93922601	08-16-60	10	.03	76	4.5	--	--	248	3.2	--	.2	--	--	245	--	208	5	418	7.7	--	81
93922701	08-16-60	15	.08	87	1.2	--	--	262	1.2	--	.2	--	--	266	--	222	8	441	7.8	--	80
93922702	08-16-60	9.2	.58	59	3.6	--	--	202	--	--	.2	--	--	203	--	162	0	341	7.6	--	74
94021102	07-14-60	36	.09	42	19	--	--	216	--	--	.4	--	--	216	--	182	5	365	7.9	--	74
94021701	07-20-60	30	.05	46	16	8.9	.7	222	8.0	9.0	.3	.2	--	228	227	181	0	370	8.2	--	74
94021702	07-20-60	33	.05	46	17	--	--	220	--	9.5	.5	.0	--	239	--	135	4	376	7.7	--	74
94021802	07-20-60	9.4	.07	12	4.5	--	--	76	--	--	.5	--	--	82	--	50	0	147	7.5	--	76
94021804	07-20-60	23	.33	49	19	--	--	270	--	--	.6	--	--	245	--	200	0	414	7.7	--	79
94021902	07-20-60	29	.17	62	21	--	--	244	36	12	.4	--	--	303	--	242	42	468	8.0	--	81
94021903	07-20-60	26	.17	55	18	--	--	246	22	--	.5	--	--	268	--	211	10	433	8.1	--	83
94022401	08-15-60	8.2	.06	70	1.8	--	--	208	22	10	0.2	.2	--	224	--	182	12	391	7.8	--	77
94120701	07-15-60	20	.05	35	17	--	--	200	3.6	20	.3	--	--	213	--	158	0	360	7.8	--	--
94121101	07-14-60	35	.29	37	20	--	--	224	--	--	.3	--	--	231	--	174	0	367	7.8	--	74
94122401	08-16-60	17	.02	51	9.5	--	--	204	--	--	.5	--	--	199	--	166	0	333	7.7	--	74
94123401	07-29-60	--	.02	--	--	--	--	52	--	--	--	--	--	--	--	--	--	94	7.4	--	79
94220304	07-15-60	13	.09	32	9.2	--	--	142	.4	13	.3	--	--	147	--	118	2	261	7.6	--	83
94220305	07-15-60	19	.01	45	17	--	--	228	--	--	.4	--	--	228	--	182	0	389	7.7	--	77
94220306	07-15-60	15	.05	33	8.6	--	--	150	2.4	15	.3	--	--	162	--	118	0	277	7.6	--	80
94320401	07-15-60	28	.07	50	14	--	--	216	2.4	--	.4	.0	--	226	--	182	6	366	7.8	--	82
94320701	07-19-60	30	.09	30	11	--	--	142	4.0	14	.6	--	--	175	--	120	4	272	7.6	--	--
94321502	07-19-60	3.8	.07	25	11	5.3	0.1	134	.4	5.5	.3	.1	--	118	117	108	0	227	7.7	--	76
94322101	07-28-60	30	.04	64	25	9.2	.2	306	14	8.0	.2	.1	--	302	299	262	12	504	8.2	--	78
94422201	07-28-60	12	.02	62	12	--	--	250	--	--	.6	--	--	230	--	204	0	397	8.0	--	74
94521201	07-14-60	29	.05	54	25	--	--	288	--	--	.6	--	--	282	--	238	2	472	7.9	--	78
94523701	07-26-60	2.7	.04	24	2.7	--	--	80	5.2	--	.2	--	--	84	--	71	6	155	7.2	--	81
94620601	07-28-60	21	.24	43	9.4	9.1	1.4	178	.4	10	.4	.1	--	183	181	146	0	309	7.9	--	79
94620801	07-28-60	19	.07	42	18	--	--	214	12	12	.5	--	--	224	--	179	4	388	8.0	--	80
94621802	07-26-60	17	.46	38	15	4.8	.1	190	.8	7.0	.3	.1	--	177	178	156	1	312	8.2	--	78
94721001	07-28-60	24	.19	48	16	8.0	.2	230	2.0	10	.3	.1	--	222	220	186	0	376	8.2	3	74

Source: Data from Clark et al., 1964b.

TABLE 7-4

SUMMARY OF AVERAGE DRY WEATHER WATER QUALITY AND QUANTITY DATA FOR SWEETWATER BRANCH ALACHUA COUNTY

	Station 1	Station 2	Station 3*	Station 4	Station 5	Station 6
Flow, mgd	1.7	4.1	12.2	2.5	12.5	39.3
Temperature, °C	24.0	22.8	25.8	25.0	26.0	26.3
pH	7.8	9.1	7.4	7.2	7.2	6.8
Conductivity, μmhos/cm	351	470	516	278	455	215
Dissolved Oxygen, mg/ℓ	7.5	8.0	7.7	3.4	1.8	3.0
Coliforms (MF)/100 ml	14,500	136,000	-1	800	1,800	370
Total Kjeldahl Nitrogen, mg/ℓ as N	1.13	4.56	7.77	1.26	4.40	1.49
Nitrate, mg/ℓ as N	0.46	0.50	5.2	0.06	1.5	0.03
Nitrite, mg/ℓ as N	0.016	0.026	0.241	0.017	0.318	0.002
Total Phosphorus, mg/ℓ as P	0.20	0.418	4.94	0.293	3.59	1.43
Total Organic Carbon, mg/ℓ	15.8	22.5	20	8.7	12	17
Chemical Oxygen Demand, mg/ℓ	9.7	22.0	66	28	40	46
Solids Filterable, mg/ℓ	242	292	344	201	302	183
Solids Nonfilterable, mg/ℓ	10.1	65.7	21	4.1	9.1	4.1
Calcium, mg/ℓ as $CaCo_3$	114	111	58	113	68	50
Magnesium, mg/ℓ as $CaCo_3$	52	47	54	12	45	16
Alkalinity, mg/ℓ as $CaCo_3$	147	150	111	119	119	66
Sulfate, mg/ℓ as SO_4	7.45	18	29	3.9	23	9.5
Chloride, mg/ℓ as Cl	14.7	23.4	43	11.0	35	18
Color, APHA units	18.2	29	34	28	35	82
Turbidity, APHA units	8.0	27	24	6.1	11.0	10
Oil and Grease, mg/ℓ	–	–	7.5	4.0	4.2	4.5

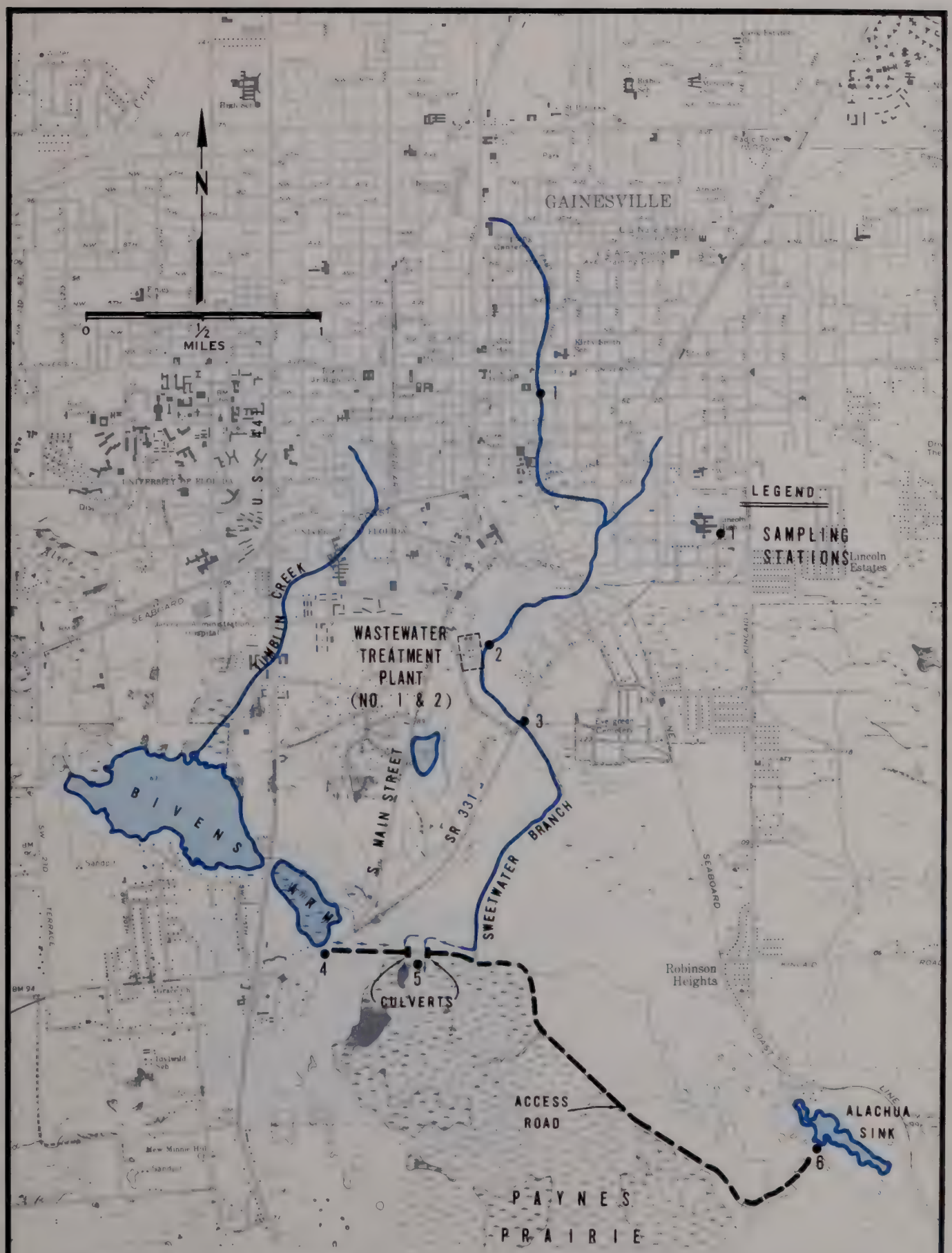
Note: The above are average values, data collected as follows: Stations 1, 2, and 3 from 12-13-71 to 1-24-72 (12 samples) Stations 3, 4, 5, and 6 from 4-5-72 to 7-17-72 (8 samples).

*Average is from 4-5-72 to 7-17-72.

TABLE 7-5

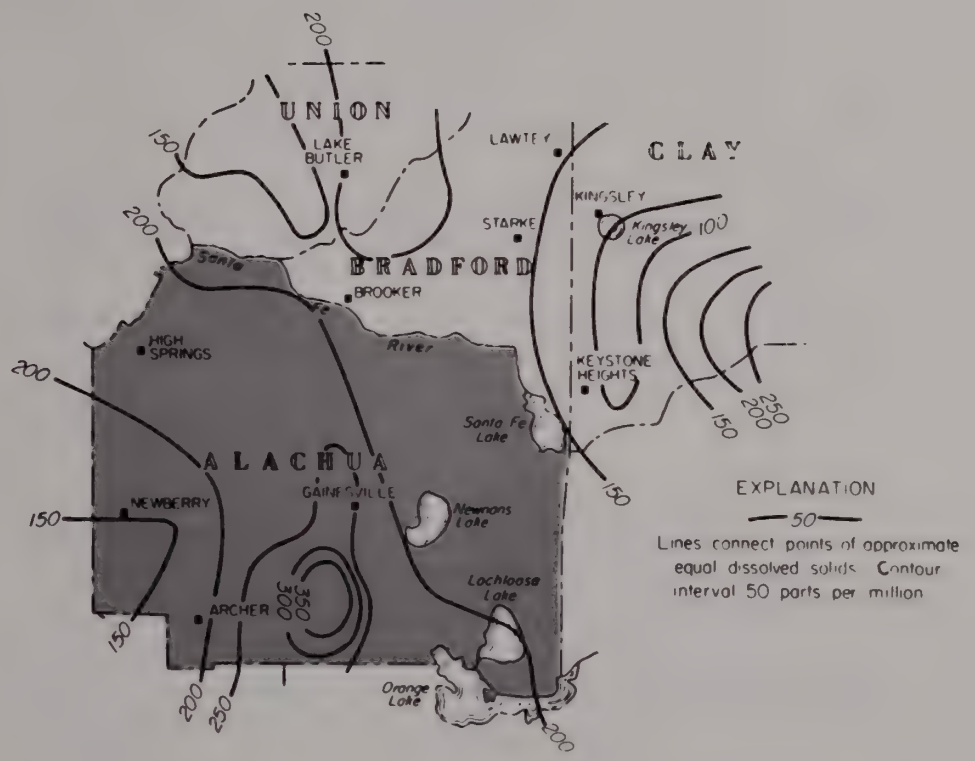
SUMMARY OF STORM FLOW AND WATER QUALITY DATA
FOR SWEETWATER BRANCH
ALACHUA COUNTY

Description	Station 3			Station 4		
Date	6-18-72	6-19-72	6-25-72	6-18-72	6-19-72	6-25-72
Time	3:15	1:15	3:00	3:30	12:55	3:11
Flow, mgd	48.5	37.8	358	.8	24.5	31
Temperature, °C	25.0	26.5	–	25.0	27.0	–
pH	8.8	7.4	7.6	7.1	7.0	6.8
Conductivity, μmhos/cm	240	225	195	305	240	205
Dissolved Oxygen, mg/ℓ	6.2	–	–	4.8	–	–
Coliforms (MF)/100 ml	12,000	-1	10,000	-1	1,000	2,500
Total Kjeldahl Nitrogen, mg/ℓ as N	2.00	1.80	1.60	0.82	0.75	1.08
Nitrate, mg/ℓ as N	.79	1.75	0.60	.12	.04	.06
Nitrite, mg/ℓ as N	.063	.119	.020	.024	.002	.003
Total Phosphorus, mg/ℓ as P	.840	1.44	.280	.600	.175	.140
Total Organic Carbon, mg/ℓ	56	16	3.0	13	8.5	4.3
Chemical Oxygen Demand, mg/ℓ	302	54	67	27	27	31
Solids Filterable, mg/ℓ	198	216	114	234	180	146
Solids Nonfilterable, mg/ℓ	920	69	251	18	13	8.0
Calcium, mg/ℓ as $CaCo_3$	58	58	38	115	96	77
Magnesium, mg/ℓ as $CaCo_3$	16	17	13	5.0	8.0	18
Alkalinity, mg/ℓ as $CaCo_3$	70	68	78	110	100	82
Sulfate, mg/ℓ as SO_4	27	25	18	25	5.0	9.5
Chloride, mg/ℓ as Cl	14	16	4.5	23	10	11
Color, APHA units	60	70	–	55	45	45
Turbidity, APHA units	375	42	114	8.7	7.9	6.1
Oil and Grease, mg/ℓ	22	4.9	6.1	6.3	3.7	3.8



The preparation of this plate was financed in part through a Comprehensive planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended. Prepared December, 1973, for North Central Florida Regional Planning Council.

LOCATION MAP WATER QUALITY SURVEY
WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS



The preparation of this plate was financed in part through a Comprehensive planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended. Prepared December, 1973, for North Central Florida Regional Planning Council.

DISSOLVED SOLIDS AND HARDNESS OF WATER IN FLORIDAN AQUIFER

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY

NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

BLACK, CROW AND EIDSNESS, INC.

ENGINEERS

SECTION 8

DRAINAGE

8.1 DESCRIPTION OF CURRENT DRAINAGE AND FLOOD PLAIN DESIGNATION STUDY FOR GAINESVILLE METROPOLITAN AREA

A comprehensive drainage and flood plain designation plan is being prepared for the 135 square mile Housing and Urban Development area in and adjacent to Gainesville. This project is being undertaken by Sverdrup and Parcel and Associates for the North Central Florida Regional Planning Council.

8.2 PRESENT STATUS OF DRAINAGE PLANNING STUDY

Test basins have been selected from topographic maps supplied by the Council and studies are in progress within these areas. Basic runoff data is being collected from selected test basins with differing soil types. This data will include amount of rainfall, amount of infiltration into soil, and measurement of runoff.

This data, along with concurrent and historical rainfall data from the U. S. Weather Bureau and the University of Florida, and stream flow data from the U. S. Geological Survey, will be used to develop recommendations for flood plain and flood channel management. This report, along with maps and other information relating to the studies, will be presented to the North Central Florida Regional Planning Council early in 1974. A complete description of the scope of the work to be performed can be found in Appendix E of this report.

SECTION 9

PROVISION OF SANITARY FACILITIES

9.1 GENERAL

Most Alachua County residents are served by one of the two types of sanitary facilities most commonly found in the county. These two types are private facilities or publicly owned facilities. The private facilities are usually individual household septic tanks. The other private sanitary facilities are owned by service stations, restaurants, trailer parks, industry, and other private large flow users. These systems are either sand filters or small package plant type operations. The public systems are the larger municipal treatment plants, being either trickling filters or activated sludge wastewater treatment plants. The municipal systems serve the urban areas by means of gravity collection systems and pumping stations to a central treatment plant.

The water facilities can also be categorized as either privately or publicly owned. The private facilities are mostly individual residential units each served by a shallow water supply well with a submersible pump and a pressure tank. Other private facilities are those mentioned previously and other private large flow users. The public facilities are, to a large extent, those owned and operated by the area municipalities.

The following two sections further describe the public and private facilities.

9.1.1 Public Systems

The public systems in Alachua County consist of institutional, recreational, and municipal facilities.

Sanitary facilities have been installed as a result of the public being aware that population density and large flows concentrated in one area place a severe strain on the environment, and that the risk of polluting area waters definitely exists in urban areas or areas where population density is great. Public sewerage and wastewater treatment also provides the Alachua County residents with better sanitation and convenience, and increased property value.

Other advantages of public sanitary facilities are those of operation and maintenance of the system and economy of scale. The larger wastewater treatment plants require constant supervision, as well as operation and maintenance from qualified operators. The largest portion of the flows treated in public facilities in Alachua County

presently receives this attention. But another advantage is the possible availability of grant funds to construct sanitary treatment facilities. With today's requirements of sophistication in technology and construction of treatment works, costs become quite high. Further discussion of federal funds appears in Section 2 of this report. Table 9-1 is the most up-to-date and complete list available of all treatment facilities, excluding private septic tanks, located in Alachua County.

Public water facilities, likewise, have the same advantage as public sanitary facilities. One other advantage which public water supply has besides supply of safe potable water, is that of fire protection. A list of all public water facilities in the county is shown in Table 9-2. This list excludes private wells.

9.1.2 Private Systems

Private water and sanitary facilities in Alachua County consist mostly of individual wells and septic tanks. In the rural communities most residents have no choice but to install one or both of these facilities. The other private owners of these facilities are the larger flow users who are not connected to a public water supply system or sanitary system.

Installation of private facilities will of necessity continue to occur in areas where no public facilities are available. Although these installations may not be desirable on a regional wide basis, if the facilities are isolated by distance and installed properly, they can be used with a moderate degree of safety. However, when development density in an area increases, public facilities become essential. At that time the private facilities are abandoned and their costs are lost to the owners. Accordingly, adequate public water supplies should be made available and public sewerage facilities should be installed in the initial stages of urban development, if at all feasible.

9.2 INVENTORY OF EXISTING SYSTEMS

A list of all public water facilities and all sanitary facilities is shown on Tables 9-1 and 9-2. These tables were compiled by combining information obtained from the Alachua County Health Department and Alachua County Pollution Control Department. The information has been updated and is considered to be a complete list of all these facilities as of October, 1973. The location of the major facilities is shown on Plates 9-1 and 9-2. The plates indicate that most of the major facilities are located in or near the areas of the county where population density is large. The rural areas of the county are mostly served by individual private water supply wells and septic tanks.

9.3 EXTENT OF WASTEWATER RECLAMATION AND REUSE

Reclamation and reuse of treated wastewater as a source of potable water is not considered since at this time reuse as potable water is not necessary or economical. Alachua County is blessed with an abundant supply of fresh potable water and with proper management and planning should have sufficient water to meet its needs without reuse of treated wastewater.

Another method of reclamation and reuse is that of spray irrigation and industrial use. Spray irrigation is gaining widespread acceptance as not only a method of disposal of treated wastewater but also a viable means of reclaiming the water and using this resource for crop irrigation. Spray irrigation is not a panacea, however, and should be used only where soils and economics permit. Several spray irrigation facilities are in the planning stages for municipalities in Alachua County. These are further discussed in Section 11.

Industrial reuse of wastewater is gaining acceptance where large industries are in need of a large supply of "process" water. This water would not be used as potable water but could be used in an industrial operation where a large volume of highly treated or potable water is not necessary. Presently no wastewater is being reused for industrial purposes in Alachua County.

Another method of reuse is recharge of the upper aquifer with highly treated effluent through drainage wells, creating the potential for reuse at a later date. In special instances, but not peculiar to Alachua County, recharge wells are used to retard the intrusion of salt water into freshwater aquifers. Fortunately the freshwater aquifers in Alachua County do not have the problem which some coastal areas of the state presently are experiencing. The use of drainage wells for one area waste treatment plant is planned and they should be constructed and in use within the next two years.

TABLE 9-1

PUBLIC WATER SUPPLY
ALACHUA COUNTY

Name and Address	Location	Type	Number Served	Type of Chlorination
Admiral Motel Rt. 1, Box 277-D Hawthorne, Florida	US 301, South of Hawthorne, (Tony Gilyard)	Motel	25	Hypo
Alachua, City of Alachua, Florida	Alachua (George Dukes City Manager)	City	3,000	Gas
Archer, City of P. O. Box 372 Archer, Florida	Archer (Mr. Benton, City Clerk)	City	950	Gas
Archer Road Village 3620 S. W. Archer Road Gainesville, Florida	3260 S. W. Archer Rd. (A. G. Ratliff)	Trailer Park	360	Hypo
Arndt Dairy Rt. 1, Box 178 High Springs, Florida	2 miles W. of High Springs on N. W. 20th (Wayne Arndt)	Dairy		Hypo
Arredondo Estates P. O. Box 38 Archer, Florida	S. W. Archer Road (C. L. Brice)	Subdivision	720	Gas

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Arredondo Village P. O. Box 38 Archer, Florida	7177 S. W. Archer Rd. (C. L. Brice)	Trailer Park	500	Gas
Art's Steak House 6421 S. W. 13th Street Gainesville, Florida	US 441, S. (A. Geiger)	Restaurant	400	None
Blue Eagle 707 N. W. 7th Avenue Gainesville, Florida	Grove Park	Restaurant		None
B & B Package & Bar P. O. Box 402 Hawthorne, Florida	US 301 about 2 miles South of Hawthorne (Robert Walker)	Restaurant	100	None
Batten's Water Supply Rt. 2, Box 73 Hawthorne, Florida	Intersection of 301 & SR 26 (Orange Heights)	Market	300	None
Bobby's Hide-A-Way P. O. Box 198 Waldo, Florida	US 301 (Bobby Bryan)	Lounge	200	None
Broken Arrow Bluff Rt. 5, Box 129 Gainesville, Florida	S. W. Archer Road (Carlos Proctor)	Subdivision	100	Hypo

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Brown's Trailer Park 4139 S. W. Archer Road Gainesville, Florida	4417 S. W. 41st Avenue (J. T. Brown, Jr.)	Trailer Park	380	Hypo
Buddy's Landing Cottages P. O. Box 548 Earlton, Florida	Earlton	Motel	50	None
Bo-Mar Dairy Rt. 2, Box 94 Alachua, Florida	2 miles N. W. of Santa Fe (Robert Buzzerd)	Dairy		None
Boyd's Lounge P. O. Box 160 Waldo, Florida	US 301 S. of Waldo	Lounge	25	None
Bud's 66 P. O. Box 336 Micanopy, Florida	I-75 & SR 329 (G. W. Adkins)	Service Station	150	None
Camp McConnell P. O. Box 252 Micanopy, Florida	US 441, 2 miles N. of Micanopy	Camp		None
Carlton's Dairy P. O. Box 158 Hawthorne, Florida	US 301 N. (Kea Carlton)	Dairy		None

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Cagles of Gainesville 3530 E. Hawthorne Road Gainesville, Florida	Same (Paul Thames)	Food		Hypo
Citgo Service Station P. O. Box 290 Micanopy, Florida	I-75 & SR 329 (Hal Evans)	Service Station	150	None
Clevinger's Lakeview Beach P. O. Box 457 Earlton, Florida	SR 200A, Earlton (Mr. Clevinger)	Fish Camp	25	None
College Inn, Inc. P. O. Box 14422, Univ. Station Gainesville, Florida	S. W. Archer Road, Near 34th Street (J. P. Ahrano)	Subdivision	125	None
Copeland Sausage Company P. O. Box 185 Alachua, Florida	Right on Copeland Rd. 1 mile S. of Alachua	Processing Plant	260	Gas
Copeland Subdivision 414 N. W. 10th Street Gainesville, Florida	Off SR 26 about 3 miles East of Gainesville (Frank Cope)	Subdivision	70	None
Copeland Trailer Park Rt. 1, Box 17 Archer, Florida	SR 241 South of Archer (F. W. Copeland)	Trailer Park	6	None

TABLE 9-1 – *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Cross Creek Lodge (Angell's) Rt. 1, Box 309 Hawthorne, Florida	Cross Creek (Edward Angell)	Food	40	None
Cross Creek Trailer Park & Fish Camp Rt. 1, Box 311 Hawthorne, Florida	Cross Creek (Mrs. Nell McCoy)	Trailer Park	50	None
Cross Creek Mobile Homes Rt. 1, Box 321-B Hawthorne, Florida	On Cross Creek (Alvin W. Kent)	Trailer Park	50	None
D & S Dairy 4700 N. W. 16th Place Gainesville, Florida	E. of LaCrosse & N. of SR 235 (Frank T. Denham)	Dairy		None
Day's Inn Motel & Restaurant Rt. 1, Box 400 Micanopy, Florida	I-75 & SR 329 (Michael M. Goodyear)	Motel	600	Hypo
Division of Corrections (Road Prison) P. O. Box 1167 Gainesville, Florida	On SR 26 N. of Lake Road (Chief Warden)	Inst.	80	None
Dixie Oil Company P. O. Box 1007 Tifton, Georgia	I-75 Micanopy Rt. 1, Box 389 Micanopy, Florida	Service Station	150	Hypo

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TABLE 9-1 – *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Elk Club No. 990 P. O. Box 488 Gainesville, Florida	2424 N. W. 23rd Blvd. (B.P.O.E.)	Food	75	None
Enco Service Station P. O. Box 687 Alachua, Florida	I-75 & 441 (Ronald Ford)	Service Station	300	None
Florida Welcome Station P. O. Box 665 High Springs, Florida	I-75 & SR 236 (Robert Saunders)	Restaurant	800	None
Forest Grove Tower 1600 N. E. 23rd Blvd. Gainesville, Florida	6 miles N. of Newberry on US 41	Inst.		None
Forest Park Preschool 4241 S. W. 34th Street Gainesville, Florida	Same	School		Chlor
Franklin Crates, Inc. P. O. Box 275 Micanopy, Florida	Off 441 at Micanopy	Factory	140	None
Gainesville, City of P. O. Box 490 Gainesville, Florida	Gainesville (Dick Vogh)	City	80,000	Gas

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Gainesville, City of (Municipal Generating Station) P. O. Box 490 Gainesville, Florida	US 441 Near Hague	City		Gas
Gainesville Dragway P. O. Box 1646 Gainesville, Florida	4 miles N. of Airport, SR 225 (J. Raulerson)	Racetrack	17,000 (max. capacity)	None
Gainesville Drive-in P. O. Box 52 Gainesville, Florida	2400 E, Hawthorne Rd.	Drive In	150	None
Gainesville Livestock Market 4719 N. W. 6th Street Gainesville, Florida	I-75 & N. W. 39th Ave. (L. H. Thompson)	Restaurant	200	None
Gator Court 4170 S. W. 13th Street Gainesville, Florida	Same (George Schaser)	Motel	45	Hypo
General Electric Company P. O. Box 114 Gainesville, Florida	US 441 N. of Hague (Karl Kaswinkle)	Plant	600	Gas
Glynnwood Trailer Park 2307 S. W. 16th Place Gainesville, Florida	Same (Virgil Braddock)	Trailer Park	150	Hypo

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Hammer Apartments 3300 S. W. 23rd Street Gainesville, Florida	Same (Richard Hammer)	Apts.	25	None
Hawthorne, City of P. O. Box 83 Hawthorne, Florida	(Clyde H. Bell, Sr.)	City	1,400	Gas
Hawthorne Forest Tower 1600 N. E. 23rd Blvd. Gainesville, Florida	1/2 mile E. of Hawthorne North of SR 20	Inst.		None
Herman's Apartments 716 N. W. 9th Avenue Gainesville, Florida	S. W. Archer Road (Laverne Fender)	Apts.	30	None
Hickory Hill Mobile Home Park 2720 S. W. Archer Road Gainesville, Florida	Same (W. H. Allen)	Trailer Park	150	None
High Springs, City of Box 1008 High Springs, Florida	Nevin Graham - City Manager	City	3,850	Gas
Dragon Drive In P. O. Box 807 High Springs, Florida	1 mile S. E. of High Springs on US 441	Drive In	40	None

TABLE 9-1 – *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Hillcrest Trailer Park 3009 S. E. Hawthorne Road Gainesville, Floirda	Same (Merrill Parker)	Trailer Park	350	Hypo
Ironwood Golf Club 1515 N. W. 12th Road Gainesville, Florida	1/2 mile W. of SR 24 on N. E. 39th Avenue (2100)	Food	60	Hypo
Jost Dairy Farm Rt. 2, Box 61 Hawthorne, Florida	CR S. E. 30 1 Mile W. of US 301 (Mildred Jost)	Dairy		None
Kanapaha Pre-School Center Rt. 4, Box 309 C Gainesville, Florida	4 miles W. of I-75 on SR 24 (Rev. A. D. Cross)		30	None
Kalaqua Youth Camp P. O. Box 244K High Springs, Florida	On Santa Fe River, of High Springs (J. R. Quick)		175	None
LaCrosse Forest Tower 1600 N. E. 23rd Blvd. Gainesville, Florida	1 mile N. of LaCrosse on SR 121	Inst.		None
Lake Alto Estates SCAM, Inc. P. O. Box 609 Gainesville, Florida	1 mile N. E. US 301 on N. E. 11 (SCAM, Inc.)	Subdivision	50	None

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Loblolly Learning Com. Inc. P. O. Box 12719 Univ. Station Gainesville, Florida	1 mile N. of SR 329 B & 1/2 mile E. of	Inst.	34	None
Lochloosa Springs Fish Camp P. O. Box 51 Lochloosa, Florida	1-1/2 mile N. of Lochloosa off US 301 (Leonard J. Nytz)		25	None
McGilvary's Fish Camp 7406 S. E. 2nd Avenue Gainesville, Florida	SR 329-B & Newnan's Lake		30	None
McKoy's Slaughtering P. O. Box 215 Newberry, Florida	US 441, N. Newberry (Hayward McKoy)	Slaughter House	25	Hypo
Maddox Foundry & Machine P. O. Box 7 Archer, Florida	(R. M. Hipt)		100	None
Magnesia Springs P. O. Box 507 Hawthorne, Florida	SR 20A, about 3 miles W. of Hawthorne (David Reber)		100	None
Micanopy Forest Tower 1600 N. E. 23rd Blvd. Gainesville, Florida	Micanopy	Inst.		

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Micanopy, Town of Micanopy, Florida	City Clerk	Town	750	Gas
Miller's Water Supply 6600 S. W. 13th St. Gainesville, Florida	Hawthorne Rd. Near 35th St.	Subdivision	720	Hypo
Motel Tabor 4041 S. W. 13 Street Gainesville, Florida	Same (F. J. Tabor)	Motel	35	Hypo
Nebson Dairy Rt. 1 Newberry, Florida	SR 325, 1-1/2 miles S. SR 26 (R. Nesler)	Dairy		None
Newberry, City of P. O. Box 368 Newberry, Florida	(J. W. Caldwell)	City 1,110	Gas	
Newnan's Lake Rec. Area Box 582 Gainesville, Florida	SR 20, Newnan's Lake c/o Roy Miller	Inst.		None
Oak Crest Enterprises P. O. Box 26 Hawthorne, Florida	SR 20, 1 mile E. of Hawthorne (Jerry Watson)		100	None
Oakmont Estates Rt. 1 Box 89 Alachua, Florida	US 441, 1 mile E. of Alachua (P. S. Gonzales, Sr.)	Subdivision	30	None

TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Old Bellamy Road Camp Pk. Rt. 1, Box 322 High Springs, Florida	SR 236 & I-75 at Traxler (J. D. Raulerson, MD)	Camp	80	None
O'Neal Trailer Park 3001 Hawthorne Road Gainesville, Florida	(Charlie O'Neal)	Trailer Park	175	Hypo
Korn Kettle of Fla., Inc. 2026 N. W. 17 Lane Gainesville, Florida	SR 24, 1-1/2 miles N. E. of Fairbanks			None
Pat's Fish Camp P. O. Box 23 Hawthorne, Florida	US 301, 1 1/2 miles N. of Lochloosa (F. B. Patterson)		75	None
Plantation Motor Inn Rt. 1, Box 375 Gainesville, Florida	US 441 (Mr. Williams)	Motel	15	None
Pleasant Villa Tr. Pk. 4611 N. W. 6th Street Gainesville, Florida	Same (Jack Wilson)	Trailer Park	35	None
Pep-O Service Station P. O. Box 8248 Gainesville, Florida	I-75 & US 441 (Everett Mayfield)	Service Station	500	None

TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Pleasant Valley Tr. Pk. Rt. 1, Box 8 Newberry, Florida	US 41 N. (Birge Batlino)	Trailer Park	25	None
Polk's Fish Camp Lochloosa, Florida	Lake Lochloosa (Theodore Polk)		25	None
Prairie View Apartments 6315 S. W. 13 Street Gainesville, Florida		Apts.	100	Hypo
Prairie View Mobile Village 4000 S. W. 47 Street Gainesville, Florida	(John Connell)	Trailer Park	1,000	Gas
Progress Trailer Park Rt. 3, Box 94 Gainesville, Florida	US 441, Hague (A. W. Tanner)	Trailer Park	190	Hypo
Rawlings Park P. O. Box 582 Gainesville, Florida	Cross Creek (Roy Miller)	Inst.		None
Rick's Trailer Park P. O. Box 64 High Springs, Florida	US 441, Hague (Rick McDowell)	Trailer Park	25	Hypo

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TABLE 9-1 – *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Rolling Hills Dairy, Inc. Rt. 1 Box 123 Archer, Florida	US 41, 2 miles N. of Archer (Jack Hufty)	Dairy		None
Santa Fe High School 1817 E. University Ave. Gainesville, Florida	US 441, 1/2 mile W. of I-75 (P. S. Gonzales, Sr.)	School	750	None
Santa Fe Hills Subdivision Rt. 1, Box 89 Alachua, Florida	US 441, 1 mile E. of Alachua	Subdivision	360	Hypo
Santa Fe Shores P. O. Box 514 Earlton, Florida	(A. P. Lowry)	Cabins	30	None
Shell Oil Station P. O. Box 13326 Gainesville, Florida	I-75 & N. W. 39th Ave. (Pete Shackelford)	Service Station	250	None
Stallings Corner P. O. Box 138-A Waldo, Florida	N. of Waldo, US 301 (Tom Stallings)	Lounge	50	None
Serenola Mobile Homes 4401 S. Main Street Gainesville, Florida	(Opel K. Clevinger)	Trailer Park	25	None

TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Shady Nook Trailer Pk. (Bakers) 3111 S. W. 34th St. Gainesville, Florida	Same	Trailer Park	230	None
Sheffield's Trailer Pk. 4700 Archer Rd. Gainesville, Florida	(Mr. Sheffield)	Trailer Park	75	None
Shipman's Fish Camp P. O. Box 577 Earlton, Florida	Earlton (R. L. Shipman, Jr.)		75	None
Sperry Rand Corp. Waldo Road Gainesville, Florida	SR 24 & SR 225 (Paul Bergman)	Plant	400	Gas
Spring Hill Poultry, Inc. P. O. Box 182 High Springs, Florida	(Larry Manning)	Food		
Standard Oil Co. Rt. 1, Box 398 Micanopy, Florida	I-75 & Flemmington Road		20	None
Standard Oil Co. Alachua, Florida	I-75 & US 441 (Charles Fraizer)			None

TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Standard Oil Co. Rt. 3, Box 217 Gainesville, Florida	I-75 & 39th Ave.		300	None
Standard Oil Co. Box 508 High Springs, Florida	I-75 & SR 236 (Charles Frazier)		500	None
Star Motel P. O. Box 517 High Springs, Florida	1 mile S. on US 41 (B. B. Crane)	Motel	25	None
Steinert's Trailer Park P. O. Box 188 Melrose, Florida	(Mrs. Steinert)	Trailer Park	12	None
Steve's Trailer Park Rt. 1, Box 30-3/4 Gainesville, Florida	Fairbanks (Steve Elwood)	Trailer Park	28	None
Stuckey's Restaurant P. O. Box 217 Micanopy, Florida	I-75 & SR 329 (G. T. Montgomery)	Restaurant	500	Hypo
Suburbia Drive In P. O. Box 722 Gainesville, Florida	2715 N. W. 13 St. Wayne Kaher	Drive In	150	None

TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Sunland Training Center P. O. Box 1150 Gainesville, Florida	1600 N. Waldo Rd. (O. K. Matheny)	Inst.	3,000	Gas
Sunshine Motel Rt. 1 Newberry, Florida	US 441, S. of Newberry (Dan Eger)	Motel	15	None
Sun Oil Company Jacksonville, Florida	I-75 & 236, High Springs (C. J. Ulmer)	Service Station	300	None
Tots N Tykes Rt. 1, Box 173A Alachua, Florida	N. 441 between Alachua & High Springs (Holt Browning)	Day Care Center	30	None
Thomas Fishing Resort Rt. 1, Box 294 Hawthorne, Florida	SR 325 about 1 mile S. E. of Cross Creek (Mr. Thomas)	Fishing Resort	15	None
Thomastown Mills P. O. Box 22036 Tampa, Florida	I-75 and SR 329 Micanopy	Outlet	250	None
Three Hundred Club 3715 N. W. 12th Avenue Gainesville, Florida	(David Hess)		50	None

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Town & Country Trailer Lodge 3860 Archer Road Gainesville, Florida	(A. L. Lunsford)	Trailer Park	345	None
Traveler's Safari Camp Rt. 2, Box 250 Alachua, Florida	1-1/2 miles N. of US 441 & I-75 (E. A. Spencer)	Camp	80	None
Twin Lakes Fish Camp Rt. 1, Box 323-A Hawthorne, Florida	On Cross Creek	Fish Camp	40	None
University of Florida Beef Research Unit Rt. 1, Box 116-D Gainesville, Florida	SR 225 (Dr. Kroger)	Inst.	40	Hypo
University of Florida Dairy Research Rt. 3, Box 73 Gainesville, Florida	SR 237, Hague (Dr. Wilcox)	Inst.	30	None
Villa Nova Lounge 3110 N. W. 52 Place Gainesville, Florida	N. W. 39th Ave., 2 miles W. of I-75	Restaurant	100	None
Villa Vecchio Ocala, Florida	US 441, Micanopy (Peter J. Vecchio)	Restaurant	150	None

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Waldo, City of P. O. Box B Waldo, Florida	(Mrs. Kelley-clerk)	City	700	Hypo
Watkins Dairy Rt. 2, Box 291 Hawthorne, Florida	Off US 301, about 1 mile N. of Hawthorne (Mr. Watkins)	Dairy		
Wayfarer Motel P. O. Box 973 High Springs, Florida	(Mr. and Mrs. Shearer)	Motel	20	None
West End Golf Course P. O. Drawer 14524 Gainesville, Florida	3-1/2 miles W. of I-75 on SR 26 (Howard Hodor)		130	Gas
Westgate Mobile Manor 5816 S. W. Archer Gainesville, Florida	Approx. 2 miles W. of I-75 on SR 24 (E. Blythe)	Trailer Park	210	Hypo
Westside Nursery 1910 S. W. 34th Street Gainesville, Florida	(Mrs. Cecil Simmons)	School	50	None
Wimberly Estates Rt. 2, Box 381-A-5 Gainesville, Florida	4100 N. W. 36th Terrace (Lloyd Myrick)	Subdivision	100	Hypo

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TABLE 9-1 — *Continued*

Name and Address	Location	Type	Number Served	Type of Chlorination
Yearling Restaurant Rt. 1, Box 307 Hawthorne, Florida	Cross Creek	Restaurant	40	None
Bethel Temple Day Care Center P. O. Box 1064 Gainesville, Florida	4507 E. Hawthorne Road (Rev. John L. Waldron)	Day Care Center	30	None
Island Groves P. O. Box B Island Grove, Florida	US 301 S. of Island Grove (H. Evans)	Outlet		None
J & J Ranch Box K Hampton, Florida	US 301, Waldo, Florida (Billy Wagner)	Ranch		None
Parrish Sandwich Shop Rt. 2, Box 236 Gainesville, Florida	S. E. Hawthorne Road (Cecil & Shirley Parrish)	Food Processing Plant		None
Paynes Prairie State Preserve 4801 S. E. 17th Street Gainesville, Florida	Same	Inst.	30	None
Technical Properties Newberry Road Gainesville, Florida	Same	Office	150	None

Source: Alachua County Health Department, 1973 (updated).

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TABLE 9-2

PUBLIC SEWERAGE SYSTEMS
ALACHUA COUNTY

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
A. L. Mebane School (Marvin Messer) Board of Public Instruction 1817 East University Avenue Gainesville, Florida	Alachua	School Open Sand Filter	510
Alachua Elementary School Board of Public Instruction 1817 East University Avenue Gainesville, Florida	Alachua	School 7,500 gpd, Extended Air	700
Copeland Sausage, Inc. (J. Franklin Copeland) Alachua, Florida	Alachua	Oxidation Lagoons	
Holiday Inn of America (Frank Brent, Manager) I-75 and US 441 Alachua, Florida	Alachua	Motel 20,000 gpd, Contact Stabilization	200
Santa Fe High School Board of Public Instruction 1817 East University Avenue Gainesville, Florida	US 441, between High Springs and Alachua	School Open Sand Filters	750

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TABLE 9-2 – *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Archer Community School Board of Public Instruction 1817 East University Avenue Gainesville, Florida	Archer	School 7,500 gpd, Extended Air	400
Cross Creek Lodge (Angell's) (Edward Angell) Rt. 1, Box 309 Hawthorne, Florida	Cross Creek	Fish Camp Sand Filter Bed	40
Cross Creek Mobile Home Estates (Alvin W. Kent) Rt. 1, Box 321-B Hawthorne, Florida	SR 325, Cross Creek	Trailer Park 4,500 gpd, Extended Air	200
Arredondo Village Trailer Park (C. L. Brice) P. O. Box 38 Archer, Florida	7117 S. W. Archer Rd.	Trailer Park 60,000 gpd, Extended Air	500
Brittany Estates (Carl Durham) 5110 Northeast Waldo Road Gainesville, Florida	Gainesville	Trailer Park 75,000 gpd, Extended Air	550
Brown's Trailer Park (J. T. Brown, Jr.) 4139 Archer Road Gainesville, Florida	4417 S. W. 41st Ave.	Trailer Park 12,000 gpd, Extended Air	380

TABLE 9-2 — *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Buchholz Jr.-Sr. High School Board of Public Instruction 1817 East University Avenue Gainesville, Florida	5510 N. W. 27th Ave.	School 25,000 gpd, Extended Air	1,200
Contractor's Supply (Harry Dougherty) 3010 North Waldo Road Gainesville, Florida	Gainesville	Business Closed Sand Filter	40
Eastern Gas Station (Alice Folsum) 3735 Neptune Street Tampa, Florida	1516 S. E. 4th St.	Service Station & Market Closed Sand Filter	270
Eastside Jr.-Sr. High School Board of Public Instruction 1817 East University Avenue Gainesville, Florida	S. E. 43rd St., N. of Hawthrone Rd. 1201 S. E. 45th Terr.	School 25,000 gpd, Extended Air	1,600
Exxon Service Station (Vernon C. Warren) I-75 and Newberry Road Gainesville, Florida	Gainesville	Service Station Closed Sand Filter	300
Gainesville Dragway (Jim Raulerson) P. O. Box 1646 Gainesville, Florida	4 miles N. of Airport on SR 225	Racetrack 2 Closed Sand Filters	17,000 (Maximum Capacity)

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TABLE 9-2 – *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Gainesville Livestock Market (L. H. Thompson) 4719 Northwest 6th Street Gainesville, Florida	N. 441	Market 20' X 20' Filter Bed	200
Hickory Hill Trailer Park (W. H. Allen) 2720 Southwest Archer Road Gainesville, Florida	Gainesville	Trailer Park Open Sand Filters	150
Hillcrest Trailer Park (Merrill Parker) 3009 Southeast Hawthorne Road Gainesville, Florida	Gainesville	Trailer Park 5,600 gpd, Extended Air	160
Ironwood Golf Club (Fred Barnard) 2100 Northeast 39th Avenue Gainesville, Florida	Gainesville	Golf Course Closed Sand Filters	60
Lake Forest Elementary School (Marvin Messer) 1817 East University Avenue Gainesville, Florida	427 S. E. 43rd St.	School 2 Open Sand Filter Bed Systems	680
Myra Terwilliger School (Marvin Messer) 1817 East University Avenue Gainesville, Florida	301 N. W. 62nd St.	School Open Sand Filter	800

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TABLE 9-2 – *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Phillips 66 Station (Chester Sheldon) 4033 Southwest 13th Street Gainesville, Florida	Gainesville	Service Station Closed Sand Filter	200
Prairie View Apartments (Leon Brinson) 6315 Southwest 13th Street Gainesville, Florida	Gainesville	Apartments 4,800 gpd, Extended Air	100
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 1 427 S. Main St.	5mgd, Trickling Filter	
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 2 427 S. Main St.	4.5 mgd, Contact Stabilization	
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 3 Paynes Prairie	55,000 gpd, Extended Air	
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 4 Northwood	100,000 gpd, Extended Air	

TABLE 9-2 – *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 5 Hawthorne Roadside Park US 301 Lake Hawthorne	5,000 gpd, Extended Air	
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 6 Robinlane Subdivision	28,000 gpd, Extended Air	
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 7 Hickory Wood	12,000 gpd, Extended Air	
Regional Utilities Board (Dick Vogh) P. O. Box 490 Gainesville, Florida	Plant No. 8 Jonesville Mall Newberry Rd.	10,000 gpd, Extended Air	
Robinswood Terrace	Archer Rd.	2,400 gpd, Extended Air	
Shady Nook Trailer Park (Baker's) (Charles Amos) 3101 Southwest 34th Street Gainesville, Florida	Gainesville	Trailer Park 9,000 gpd, Extended Air	230

TABLE 9-2 — *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Shell Oil Station (John Sneed) 4030 Southwest 13th Street Gainesville, Florida	Gainesville	Service Station Closed Sand Filter	300
Sperry Rand Corporation (John Rowe) Waldo Road Gainesville, Florida	SR 24 and SR 225	Manufacturing Plant 6,320 gpd, Septic Tank & Open Sand Filter	400
Standard Oil Company (Robert Young) 4114 Southwest 13th Street Gainesville, Florida	Gainesville	Service Station Closed Sand Filter	300
Sunland Training Center (O. K. Matheny) P. O. Box 1150 Gainesville, Florida	Waldo Rd.	Institution 500,000 gpd, Trickling Filter	3,000
Valley View Mobile Home Park (Wesley Johnson) 3301 Rocky Point Road Gainesville, Florida	Gainesville	Trailer Park 15,000 gpd, Extended Air	270
Villa Nova (Paul LaCroix) 3110 Northwest 52nd Place Gainesville, Florida	2 miles W. of I-75 on N. W. 39th Ave.	Lounge Closed Sand Filter	100

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TABLE 9-2 – *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
West Cash and Carry 3330 North Waldo Road Gainesville, Florida	Past 39th Ave. on Waldo Rd.	Market Closed Sand Filter	15
Westgate Mobile Manor (E. Blythe) Rt. 5, Box 106-1 Gainesville, Florida	Approx. 2 miles W. of I-75 on SR 24	Trailer Park 21,500 gpd, Extended Air	210
Wildlife Research Center Laboratory (Department of Interior) 3700 East University Avenue Gainesville, Florida	Lake Rd.	Laboratory 5,000 gallon, Septic Tank	12
Lincoln Gulf Service Station (Mr. Thomas) P. O. Box 956 Gainesville, Florida	1106 S. E. 4th Ave.	Service Station Closed Sand Filter	225
Whitney Mobile Home Park (Charles Whitney) 2909 Northwest 29th Street Gainesville, Florida	N. W. 441 – 2-1/4 miles N. of SR 121	Mobile Home Park 30,000 gpd, Extended Air	240 (Design Capacity)
Powers Shopping Center (Curtis Powers) 3807 East University Avenue Gainesville, Florida	Gainesville	Shopping Center Closed Sand Filter	100

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TABLE 9-2 – *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Prairie View Mobile Home Village (John Connell) 3612 Northwest 16th Boulevard Gainesville, Florida	1/4 mile W. of I-75 and N. of Archer Rd.	Trailer Park 60,000 gpd, Extended Air	
Hermann's Apartments (Laverne Fender) 716 Northwest 9th Avenue Gainesville, Florida	3708-3718 S. W. Archer Rd.	Apartment Building 2,400 gpd, Extended Air	30
Westside Animal Hospital (Dr. Wilbur Wood) 5508 Northwest 13th Street Gainesville, Florida	Gainesville	Gravel Filter Bed	5
Circle R Restaurant (Tim Powell) P. O. Box 14 Hawthorne, Florida	Hawthorne, US 301	Restaurant 2,500 gpd, Extended Air	160
Hawthorne Elem. & Jr.-Sr. High School Board of Public Instruction 1817 East Unviersity Avenue Gainesville, Florida	Hawthorne	School 20,000 gpd, Extended Air	850
Shell Middle School Board of Public Instruction 1817 East University Avenue Gainesville, Florida	Brown St. Hawthorne	School Closed Sand Filter	300

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TABLE 9-2 — *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Standard Oil Company (Joe McMeekin) Lake Street Hawthorne, Florida	Hawthorne	Service Station Sand Filter	150
Ray's Laundromat Hawthorne, Florida	Hawthorne, SR 26	Laundromat 11,500 gpd, Trickling Filter	
General Electric Plant (R. E. Butcher) Sanitary Waste P. O. Box 114 Gainesville, Florida	US 441, Hague	Manufacturing Plant 10,200 gpd, Extended Air	600
General Electric Plant (R. E. Butcher) P. O. Box 114 Gainesville, Florida	US 441, Hague	Manufacturing Plant Lagooning of Industrial Waste	
Progress Trailer Park (A. W. Tanner) Rt. 3, Box 94 Gainesville, Florida	US 441, Hague	Trailer Park 13,000 gpd, Extended Air	190
Spring Hill Middle School (Marvin Messer) 1817 East University Avenue Gainesville, Florida	High Springs SR 236	School 15,000 gpd Extended Air	400

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TABLE 9-2 — *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
8 Days Inn (Cecil B. Day) Micanopy, Florida	I-75 and Micanopy	Motel-Restaurant 15,000 gpd, Extended Air	
American Service Station (John White) P. O. Box 99 Alachua, Florida	I-75 and US 441	Restaurant Closed Sand Filter	500
Atkinson's Shell Station & Restaurant (J. J. Parrish) P. O. Box 128 Alachua, Florida	I-75 and US 441	Restaurant & Service Station Closed Sand Filter	500
Exxon Service Station (Ronald Ford) P. O. Box 687 Alachua, Florida	1-75 and US 441	Service Station Closed Filter	300
Gulf Oil Corporation (Bob Swesey) P. O. Box 956 Alachua, Florida	I-75 and US 441	Service Station 28'4" X 17'4" Filter Bed	300
Standard Oil Company (Ralph Walker) Rt. 2, Box 142 AA Alachua, Florida	I-75 and US 441	Service Station Closed Sand Filter	400

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TABLE 9-2 — *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Texaco, Inc. (L. McNeil) P. O. Box 52332 Houston, Texas	I-75 and US 441	Service Station Closed Sand Filter	500
Wayfara (Carl Jones) Archer Road Gainesville, Florida	I-75 and US 441	Restaurant 11,000 gpd, Extended Air	
Department of Transportation (G. S. Burleson, Jr.) Rest Area (East) P. O. Box 1109 Gainesville, Florida	I-75 at Paynes Prairie	Institution 12,500 gpd, Extended Air	1,500
Shell Oil Company P. O. Box 13326 Gainesville, Florida	I-75 and N. W. 39th Ave.	Service Station Closed Sand Filter	300
Texaco, Inc. (Mr. Taylor) P. O. Box 52332 Houston, Texas	I-75 and SR 26 Gainesville	Service Station Closed Sand Filter	300
Florida Welcome Station (Bernice and Harry Guynn) P. O. Box 665 High Springs, Florida	I-75 and SR 236	Restaurant 4,000 gpd, Extended Air	800

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TABLE 9-2 — *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Standard Oil Company (Charles Frazier) P. O. Box 508 High Springs, Florida	I-75 and SR 236	Service Station Closed Sand Filter	500
Sun Oil Company (C. J. Ulmer) High Springs, Florida	I-75 and SR 236	Service Station Closed Sand Filter	300
Day's Inn Motel & Restaurant (Michael M. Goodyear) Rt. 1, Box 400 Micanopy, Florida	I-75 and SR 329-B	Motel & Restaurant 19,000 gpd, Extended Air	600
Dixie Oil Company (J. Starling) P. O. Box 1007 Tifton, Georgia	I-75 and SR 329—B	Service Station 2,500 gpd, Extended Air	150
Standard Oil Company P. O. Box 102 C Micanopy, Florida	I-75 and SR 329-B	Service Station Extended Air	20
Textile Town (Mark McGomery) P. O. Box 217 Micanopy, Florida	I-75 and SR 329-B	Market Closed Sand Filter	250

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TABLE 9-2 — *Continued*

Name and Address	Location	Type of Establishment, Capacity, Type of System	Number Served
Citgo Service Station (Hal Evans) Rt. 1, Box 290 Micanopy, Florida	I-75 and Flemington Rd.	Service Station	150
Adkins Truck Stop (S. W. Adkins) P. O. Box 136 Micanopy, Florida	US 441, Micanopy	Restaurant Closed Sand Filter	50
Micanopy Recreation Center Board of City Commissioners	Main St., Micanopy	Recreation Center Closed Sand Filter	10
Top Ten Minit Mart & Fluffy White Laundry (Don Deconna) P. O. Box 34 Micanopy, Florida	US 441, Micanopy	Laundry 8,300 gpd, Trickling Filter	30
Camp McConnell (Bob McNare) YMCA of the Palm Beaches P. O. Box 252 Micanopy, Florida	US 441, N. of Micanopy	Camp 8,300 gpd, Extended Air	90
Newberry Jr.-Sr. High School (Marvin Messer) 1817 East University Avenue Gainesville, Florida	Newberry	School 20,000 gpd, Extended Air	670

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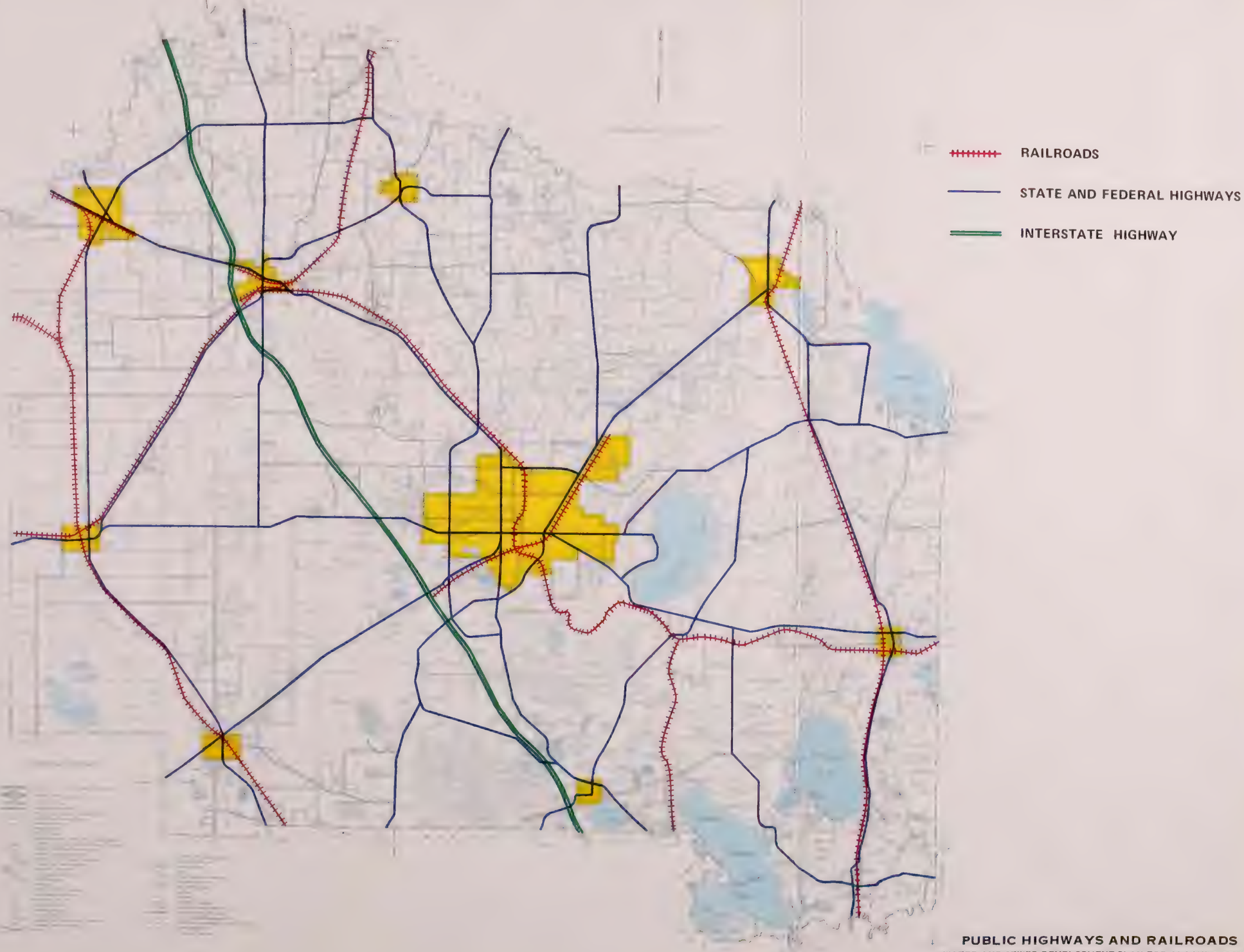
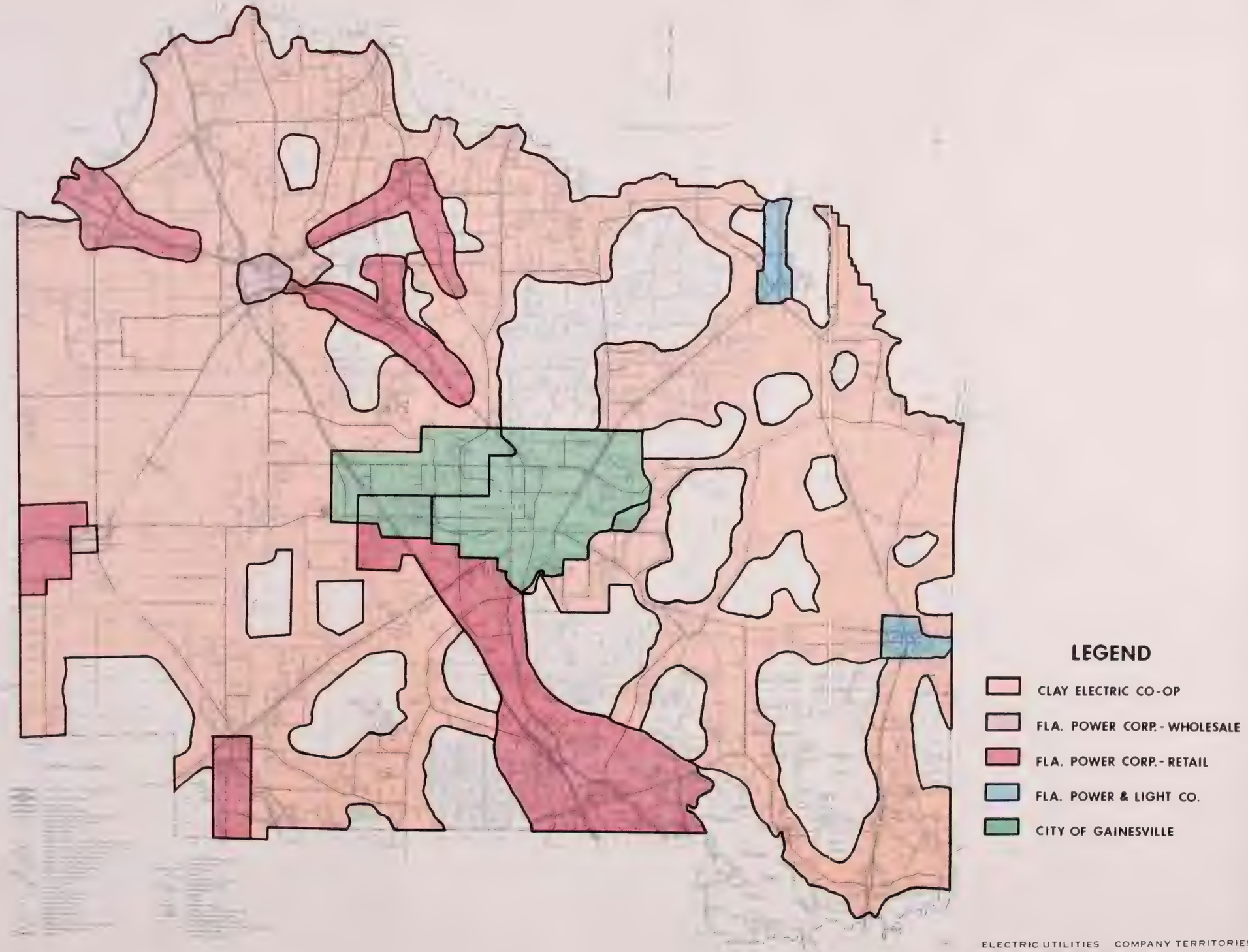


The preparation of this plate was financed in part through a Comprehensive planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended. Prepared December, 1973, for North Central Florida Regional Planning Council.

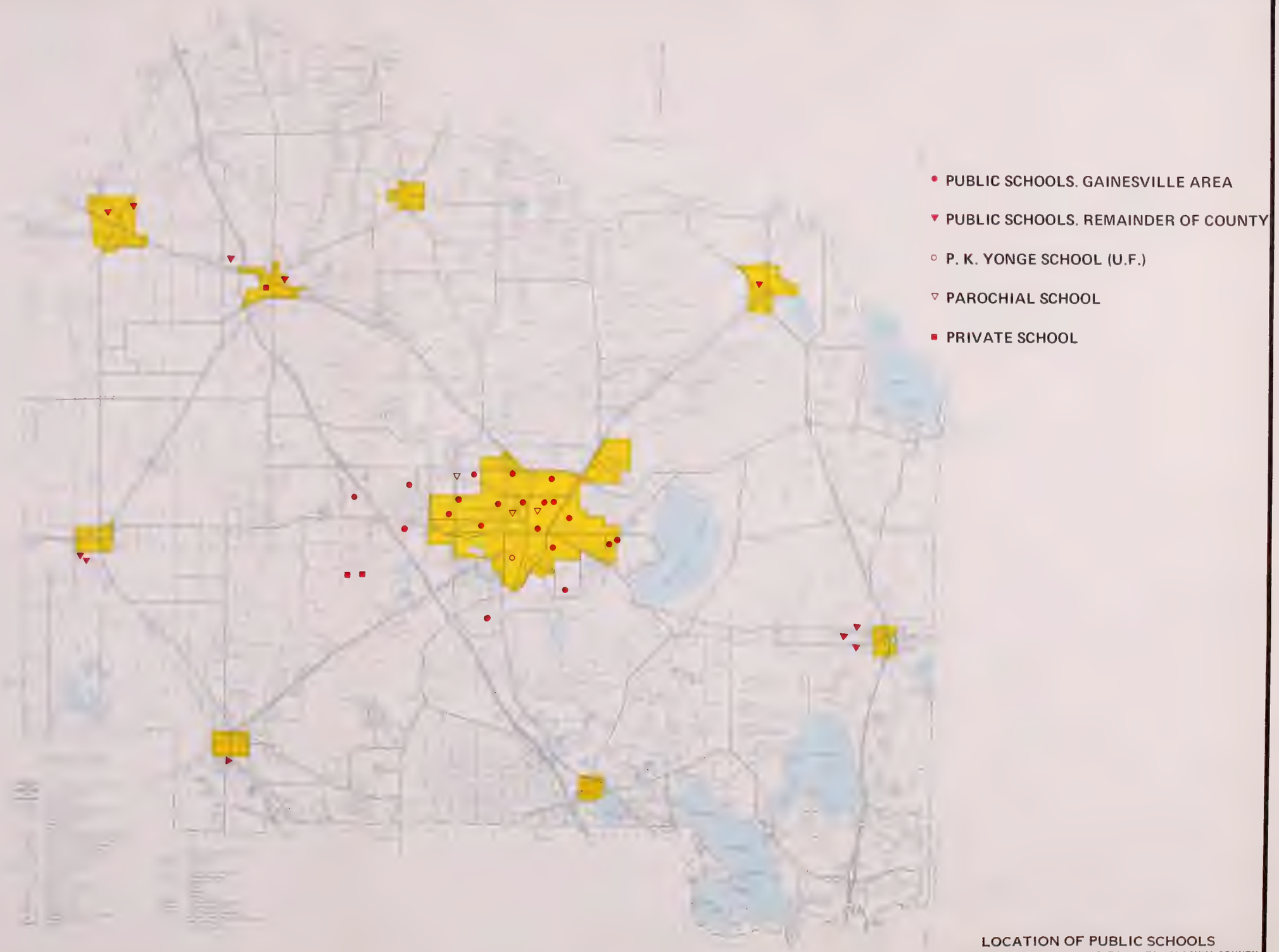
PUBLIC HIGHWAYS AND RAILROADS

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS



The preparation of this plate was financed in part through a Comprehensive planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954 as amended. Prepared December, 1973, for North Central Florida Regional Planning Council

ELECTRIC UTILITIES COMPANY TERRITORIES
WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC
ENGINEERS



LOCATION OF PUBLIC SCHOOLS

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS

219-73-50

PLATE 6-3

PART II

WATER AND SEWER DEVELOPMENT

SECTION 10

WATER FACILITIES PLAN

10.1 GENERAL

The water needs of the people in the Alachua County Planning Area must be met, while at the same time maintaining sound technical and fiscal control over methods for answering those needs. In consideration of the impact of future land use on water facilities plans, the proposed plan has attempted to provide water service wherever practical for all prospective areas subject to future development. These areas are centered around the nine incorporated areas of the county. For purposes of this report, projected populations of each of these cities were the projected high 1990 populations as determined by the Planning Council. These figures came from the Planning Council's 1972 report entitled "Population and Economic Study."

Only one of the nine incorporated population centers, LaCrosse, does not presently have a publicly owned water supply facility. Residents of LaCrosse at this time rely upon individual, privately owned water supply facilities. The unincorporated area of Melrose has two wells which have been considered municipal, although they are privately owned. The remainder of the city of Melrose is served by individual private systems.

As in many populated areas, the need for water supply facilities has led to the installation and proliferation of numerous private water supply facilities. Presently, there are approximately 140 privately owned utility systems in Alachua County, each serving 25 or more people. Of these, 38 are trailer parks with privately owned water systems serving 3,500 people. Another 18 systems sell water. With few exceptions this is raw, untreated water. These privately owned water systems have only marginal pumping and storage capacities and inadequately sized water mains, especially for fire protection.

10.1.1 Geographical Locations

The following paragraphs contained in this section will analyze the existing treatment and distribution systems, including a summary of conditions and the adequacy of each. Recommended improvements, alternate programs, and cost comparisons will be included. A summary of the recommended water development plan is contained in Section 10.4.

Waldo

The city of Waldo is 14 miles northeast of Gainesville on the portion of SR 24 known as the Waldo Road. U.S. 301 passes north to south through the city. Rail service for freight and passengers is provided by Seaboard Coastline Railroad.

The population of Waldo has varied over the years from a high in 1885 of 1,000 to a low in 1910 of 304. Since 1945 the population has seemed to stabilize and slowly increase. The 1970 population was 800 and is expected to increase to between 958 and 1,075 in 1990. This increase in population should be expected if the city's economy continues to be supported by the tourist traffic, agriculture, and railroad. Because of easy access to Waldo on SR 24, Waldo also serves as a residential area for many workers in Gainesville industry. The projected population for Waldo does not account for a large industry moving into or close to Waldo or northeast Gainesville along the Waldo Road.

The existing water facilities for Waldo consist of a deep well, a 350-gpm pump with auxiliary drive, a 75,000-gallon elevated storage tank, and a metered water distribution system consisting of 8-inch, 6-inch and smaller transmission mains and fire protection appurtenances. This system serves most of the central core and populated central residential area of the city.

With an estimated 1990 population of 1,075 and an average daily flow of 100 gpd per person the 1990 average daily flow is estimated at 107,500 gpd or 75 gpm. The maximum day is estimated at 250 percent of the average or 187 gpm and the peak hourly rate at 400 percent of the average or 300 gpm.

Using the above criteria, it appears that the existing water supply system for the city of Waldo, with additional standby equipment installed will be adequate to 1990.

Presently, no standby facilities exist for the main supply well. Therefore, it is recommended that a new well and pump be installed as soon as possible. This well would then give adequate standby service in the event that a major mechanical failure were to occur with the present well and pump.

Hawthorne

The city of Hawthorne is located in the eastern portion of Alachua County 17 miles east of Gainesville. The city is traversed by SR 20 and U.S. 301. Rail service is supplied by Seaboard Coastline Railroad.

Population in Hawthorne has remained constant and according to census records dropped from 1,167 in 1960 to 1,126 in 1970. This decrease of 3.5 percent could be attributable to a possible Census Bureau error in either the 1960 or 1970 number. In any event, it appears that population is somewhat unchanged in Hawthorne. Assuming a continued tourist trade and agriculture pursuits, a modest increase in population for 1990 should be between 1,322 and 1,639.

The existing water facilities include a distribution system, a 75,000-gallon elevated storage tank, and two water supply wells. The main well has a rated capacity of 450 gpm and the second, or standby well, has a capacity of 350 gpm.

The projected 1990 population for Hawthorne is 1,639. Using 100 gpd per person, the average daily flow is estimated to reach 163,900 by 1990 with a maximum of 409,750 gpd or 285 gpm and a peak hourly rate of 455 gpm. Using these projected requirements, the existing facilities should be adequate to 1990. This assumes that continued maintenance, renewal, and replacement of the existing facilities is performed.

Micanopy

Micanopy is the southern most incorporated town in Alachua County and is approximately 10 miles south of Gainesville. Six highways cross through or near Micanopy: SR 25A, 234, 329, 346, U.S. 441, and just to the west, I-75.

The population of Micanopy has increased at a conservative but steady rate from 658 in 1960 to 759 in 1970. Population estimates for 1990 are between 865 and 1,097.

The existing water facilities for Micanopy include a 350-gpm water supply well, an elevated storage tank of 75,000 gallon capacity, and a distribution system.

In 1990 the population of Micanopy is projected to be 1,097 which would require an estimated average daily flow of potable water of 109,700 gpd. The maximum flow is estimated at 190 gpm and the peak flow at 305 gpm. Using this criteria, the existing water supply system is adequate to meet the projected needs of the city to 1990. However, no standby well is available. Therefore, it is recommended that a new well be drilled and a new pump be installed in the well. This would give adequate standby facilities in the event of a failure of the existing pump and well.

This well would only need be installed if the city continues using deep wells without treatment as a source of water supply. If softened treated water were ever considered, installation of this well would not be required and connection with the regional water plant in Gainesville might then be appropriate.

Archer

Archer is 14 miles southwest of Gainesville on SR 24, commonly known as the Archer Road. U.S. 27 and 41 cross north and south through the city. Seaboard Coastline Railroad provides the city with rail freight service.

Over the years, the city of Archer has had a slow but stable population growth. In 1940, the population was 586. By 1970, the population increased to 898. This steady rise in population is attributable to the fact that the city's economy is strongly supported by agriculture and industry. These two features, coupled with new housing development and easy access to the urban area of the county, will continue to make Archer grow at a modest rate. The estimated population is now above 1,000 and is expected to be between 1,175 and 1,465 in 1990.

The existing water facilities for Archer consist of a deep well, a 350-gpm pump, a 75,000-gallon elevated storage tank, and a metered water distribution system complete with fire protection appurtenances in and along the built-up areas of the city.

Projected population for Archer in 1990 of 1,465 will demand an average daily flow of potable water of 146,500 gpd. The estimated maximum flow is 254 gpm and the peak is estimated at 407 gpm. The existing well is equipped with a 350-gpm pump.

The existing 350-gpm well will not be capable of meeting the projected 1990 peak demand of 400 gpm. Because there is no standby well at present it is recommended that a new well be installed and be used as the main supply well standby. Sometime prior to 1990 this well may, due to peak demand, become the main supply well and the existing supply well can be used as standby.

Before pursuing the installation of a new well, consideration of lime softened water may be desirable. If so, in lieu of constructing a new pump and well, connecting with the regional water system from Gainesville might be considered.

Newberry

Newberry is 13 miles directly west of Gainesville on SR 26—the Newberry Road. U.S. 41-27 passes through the town connecting northbound traffic with High Springs and southbound traffic with Archer. SR 235 goes northeast from the city and connects with Alachua, and SR 337 goes south from the west city limits to Bronson. Rail service is provided by Seaboard Coastline Railroad.

The population of Newberry has increased at a modest rate. From 1950 to 1960, the population increased from 873 to 1,105 and, from 1960 to 1970, the population increased from 1,105 to 1,247. The expected population for 1990 ranges from 1,570 to 2,250.

The current municipal water system serves 468 connections. This system includes two wells, each with a rated capacity of 600 gpm and an elevated storage tank of 60,000 gallon capacity. Each well has chlorination facilities. Fire protection and a distribution system are also provided.

The 1990 projected population of Newberry is 2,250 and will result in an estimated average daily flow of potable water of 225,000 gpd. The maximum in 1990 is estimated at 390 gpm with a peak hourly rate of 625 gpm. The present facilities come very close to meeting the required demands that should be placed on the system by 1990. The only recommended improvements at this time are that more vigorous programs of maintenance, renewal, and replacement be pursued. Also, the existing main supply well is in need of standby auxiliary power.

The population growth of Newberry should be watched closely and any time that either a large residential, commercial, or industrial development were to occur the needs and adequacy of the system should again be analyzed.

In the event that softened water is ever needed or desired, consideration should be given to receiving this treated water from the regional water plant in Gainesville. Before any capital expenditures are made on additional supply facilities this possibility should be looked at closely.

High Springs

The city of High Springs is located in northwest Alachua County 22 miles from Gainesville and 27 miles south of Lake City. Major highways passing through High Springs are U.S. 27, 41, and 441. SR 20 and 236 also serve the city. Rail service is provided by Seaboard Coastline.

High Springs has the second largest land area and population in Alachua County, the largest being Gainesville. In 1960 the population was 2,329; in 1970 was 2,787; and it is expected to reach between 3,675 and 4,450 in 1990.

The current water facilities include two wells, each rated at 425 gpm, a treatment plant with an upflow solids-contact treating unit and dual media filters. The capacity of the treatment plant is 440 gpm.

Ground storage of treated water consists of a 44,000-gallon clearwell and elevated storage consists of a 250,000-gallon elevated storage tank. The treated water is pumped into the distribution system which also contains fire protection appurtenances. The water is pumped from the clearwell by one of two high service pumps having a capacity of 450 gpm each at 115 feet TDH.

The projected 1990 population of High Springs is expected to reach 4,450. This projected population would have an average daily flow requirement of 445,000 gpd and maximum and peak requirements of 772 gpm and 1,236 gpm, respectively.

The design criteria and projections established in this report indicate that the existing water supply and treatment plant facilities are adequate, insofar as capacity is concerned, for service to approximately 3,770 people. If High Springs continues to grow at approximately the same rate, this capacity will be exceeded by the year 1977.

Present water quality of the existing wells is poor and the treatment plant needs better maintenance and repairs. With capacity soon to be exceeded, three alternates exist for High Springs. The first would be to obtain treated water from the regional system; the second would be to install a new plant expansion to the existing plant and update, repair, and modernize the existing plant; the third would be to consider

installation of a new well field to find water of a better quality in lieu of treatment of this water. A detailed analysis of the third alternate goes beyond the scope of this report. Considering the three alternatives, we recommend that the January, 1960, engineering report by Black, Crow and Eidsness, Inc., be updated and a new report prepared with the possibility of water being supplied by the regional system.

Alachua

The city of Alachua is located in the northwest section of Alachua County approximately 12 miles northwest of Gainesville on U.S. 441 and adjacent to I-75. Other routes which pass through Alachua are SR 20, 235, 239, and 241.

Alachua is a growing community with agriculture and industry serving to increase the population. It has increased from 1,974 in 1960 to 2,252 in 1970. The expected population for 1990 is between 3,750 and 5,825.

The existing water system of Alachua consists of two deep wells, one at 350 gpm and the other at 600 gpm. Water is chlorinated prior to being pumped into the system. This system includes one, 60,000- and one, 200,000-gallon elevated storage tank, and a distribution system complete with fire protection appurtenances.

With a projected 1990 population of 5,825 anticipated average daily flow requirements are 582,500 gpd. The associated maximum pumping rate is 1,011 gpm and the peak hourly rate is estimated at 1,618 gpm. The present water supply system is capable of serving an estimated population of 3,420. This population could be reached or slightly exceeded by 1980. Therefore, before 1980 Alachua should consider the possibility of installation of an additional well. If instead softened treated water were deemed desirable, consideration should then be given to connection with the regional water plant located in north Gainesville. In that event the new well would not be necessary.

LaCrosse

The smallest incorporated municipality in Alachua County is the community of LaCrosse. This predominantly agricultural city is crossed by SR 121 north-south and SR 235 east-west. LaCrosse is 12 miles north of Gainesville and 6 miles northeast of Alachua.

The population of LaCrosse has grown from 165 in 1960 to 365 in 1970 and should be between 460 and 750 by 1990. Public water facilities are presently not available to LaCrosse.

The immediate recommendation for LaCrosse is that the city hire a consulting engineering firm to prepare an engineering report for a central public water supply and fire protection system. The report should describe the preliminary design, construction

costs, and proposed method of financing of the water system. It is further recommended that the design and installation of the new system comply with and closely follow the guidelines established by the Regional Utilities Board and the Insurance Services Office. By doing this the system would be designed and installed in the best interests of the residents of LaCrosse now and also in the future. The report should cover the alternatives of either receiving treated water from the regional plant in Gainesville or the installation of wells.

Gainesville

Gainesville, the county seat of Alachua County, is located in the geographical center of the county. Major transportation routes passing through the city include U.S. 441 and SR 20, 24, 26, and 121. Access to I-75 is readily available by means of three interchanges to the Gainesville area with a fourth to be constructed in the near future on SR 24.

The population of Gainesville has grown from 46,146 in 1960 to 64,510 in 1970 and is expected to be approximately 98,510 by 1990. Unless a major annexation were to occur, these population figures do not adequately represent the total urban population for purposes of this report. The Gainesville urban area includes the population of Gainesville plus those living outside the corporate limits around the city. This area had an estimated population of 53,111 in 1960 and 82,411 in 1970. Projected population of the Gainesville urban area for 1990 ranges from a low of 135,383 to a high of 192,099.

The city of Gainesville's municipal water system was created in 1891. A pumping station was constructed at Boulware Springs and a limited distribution system installed. In 1913, a deep well was drilled at the power plant site and a 150,000-gallon elevated storage tank erected on what is now NE Second Street. An additional well and a pumping station within the power plant grounds were constructed in 1927.

In 1938, a water system improvements program was made possible by the Public Works Administration. The work included an additional water supply well, a 500,000-gallon ground storage reservoir, and a 500,000-gallon elevated storage tank on NW Fifth Avenue.

Chlorination of the water supply was begun in 1939 for the protection of the consumers against typhoid and other waterborne diseases. In 1945, bacteriological examination and other tests of the water supply indicated surface water contamination of the deep well aquifer. Breakpoint chlorination was immediately established to protect the bacterial quality of the water. As a result of these conditions, the City Commission authorized the planning and construction of a complete water treatment plant. This plant was placed in operation in December, 1948.

In 1955, the city undertook a major water system improvement program. The work included water supply wells, additions to the water treatment plant, a new pumping station, a 1 million-gallon elevated storage tank, and trunk mains. These additions to the system went into operation in 1956. Water system improvements from 1956 to 1967 were confined to extensions to the distribution system.

Since 1968, a program of improvements to the water system has been completed through funds from the proceeds of the Electric, Water, and Sewer Revenue Bond Issues of 1967, 1969, and 1972, and from federal grants through the Department of Housing and Urban Development (HUD).

The existing water treatment plant includes complete treatment and filtration facilities and employs the processes of lime softening followed by recarbonation, filtration, chlorination, and fluoridation.

Raw water from supply wells is treated by two upflow high rate softening units and passes to the recarbonation basin where carbon dioxide is added to lower the pH for stabilization. Water is filtered by three rapid sand and three dual media gravity filters and collected in a 200,000-gallon clearwell. The water is transferred from the clearwell by pumping to the 500,000-gallon and the 1 million-gallon ground storage reservoirs.

The excess sludge from the solids-contact units is transferred to a newly installed vacuum filter where it is dewatered for disposal. The nominal treatment capacity of the solids-contact units is 15.0 mgd. The filters are rated at 13.5 mgd at a loading of 3 gpm per square foot. The entire plant will process water at a maximum rate of 15 mgd.

Construction has begun on Water Treatment Plant No. 2. This plant, when completed, will provide 30 mgd of lime softened and filtered water with a maximum hydraulic capacity of 40 mgd. The facility has been designed in order that it can be readily expanded to 80 mgd capacity. A second 5 million-gallon ground storage reservoir is being constructed at the site to provide for maximum pumping demands anticipated in 1984. The plant has been designed utilizing the latest state-of-the-art technology in treatment and control to achieve the lowest possible costs for chemicals, power, and labor. A process computer is being installed to provide continuous system surveillance with closed loop control capabilities.

Treated water is pumped from the ground storage reservoirs to the distribution system through two pumping stations located in the immediate vicinity of the present water plant. Pumping Station No. 1 contains three high head service pumps as follows:

Pump No.	Horsepower	Capacity (gpm)	Head (ft)
1	300	5,000	180
2	300	5,000	180
3	120	2,000	190

Pumping Station No. 2 contains two, 12-mgd units operating at a total head of 175 feet. Both units are normally driven by 500-hp electric motors. One unit is also connected to a Diesel engine for emergency operation.

A 12-mgd high service pump with 500-hp Diesel drive was placed in operation in 1970 as part of the water system improvements authorized in 1966.

The water distribution system consists of water mains from 6 inches to 30 inches in diameter and covers a service area of approximately 35 square miles. Elevated storage of the system consists of a 500,000-gallon tank on NW Fifth Avenue and a 1 million-gallon elevated tank on NW Fifth Avenue and a 1 million-gallon elevated tank on NW Sixteenth Avenue.

The trunk main system prior to 1968 consisted of a 24-inch transmission main on SW Fifth Avenue and a 14-inch main on Main Street. Trunk main surveys were conducted in 1955 and 1961 to determine the operating characteristics of the system and the hydraulic condition of the major pipelines. Pressure recording and flow gaging stations were established at strategic points throughout the system. The results of the surveys indicated the major pipelines to be in good condition, with an overall Williams and Hazen "C" coefficient of 120.

With a continuous, ongoing program of renewal and replacement and excellent system operation the existing facilities in the city of Gainesville will be adequate to 1990. Additions and extensions of the system will be required as the system continues to grow. The conserted effort of the city and Regional Utilities Board will insure an always superior and adequate system of water supply.

Melrose

Melrose is 14 miles to the east of Gainesville, located on the southern shore of Santa Fe Lake on the eastern Alachua County line. The city is traversed by SR 21, 26, 219, 219A, and 200A. No rail service passes through Melrose, but is within close proximity.

As indicated in Section 10.1, Melrose is one of the two population centers of Alachua County which does not provide public water facilities. As indicated in the 1967 water and sewer development plan for Alachua County, and to this date, Melrose is unincorporated.

Due to questionable soil characteristics and the questionable efficiency of septic tanks located in Melrose as well as population density, it is imperative that an in depth engineering report be prepared for Melrose. This report should be geared towards the installation of an adequate public water supply and fire protection system. The guidelines suggested for LaCrosse should also be followed by Melrose in the preparation of this report.

Unincorporated Municipalities

Much emphasis in this engineering report has been placed upon the incorporated municipalities of Alachua County. This is due to the fact that these municipalities are, according to the land use plan, present population estimates and future population projections, the more densely populated areas of Alachua County. Consideration should also be given to the smaller, less densely populated, unincorporated communities in Alachua County. These areas will in the future also require public water facilities.

In Alachua County there are presently 13 unincorporated communities which are of significance to this engineering report. They are: Earlton, located on the west shore of Santa Fe Lake and crossed by SR 200A; Orange Heights, located at the intersection of SR 26 and U.S. 301; Campville, located south of Orange Heights on U.S. 301 at the intersection of SR 234; Rochelle, located on SR 234 just south of SR 20 and Newnans Lake; Grove Park, located on SR 20 and the intersection of SR 20A; Cross Creek, located between Orange Lake and Lochloosa Lake on SR 325; Lochloosa, located east of Lochloosa Lake on U.S. 301; Island Grove, located east of Orange Lake immediately north of the Alachua County line on U.S. 301 and traversed by SR 325; Windsor, located at the intersection of SR 234 and 325 just east of Newnans Lake; Wacahoota, located south of Gainesville on SR 121 and County Road SW 18; Santa Fe, located at the intersection of SR 121 and SR 236 north of LaCrosse; Fairbanks, located north of the Gainesville Airport on SR 24; and Hague, north of Gainesville on U.S. 441 and SR 237.

Each of these communities should obtain a preliminary engineering report of water supply needs and details on needed facilities. Because these communities are unincorporated and lie within the unincorporated areas of Alachua County, they should direct their attentions and efforts toward assistance and guidance from the Regional Utilities Board. Every effort should be made to plan facilities owned and operated by the public so that the proliferation of privately owned inadequate systems can be curtailed. If and when countywide service is available to these locations through a central, regionally operated utilities system, then these facilities will have been designed so that they will be compatible with the regional system. Expansions and extensions to these systems can then occur with minimal loss of capital investment due to being inadequately designed.

Most of these communities are located near or adjacent to the four large water bodies of eastern Alachua County. It is therefore readily apparent not only from a public health standpoint, but from a public nuisance and surface water pollution standpoint, that every effort should be made to provide adequate water and sewer facilities for these communities. It is hoped that this report will provide an impetus for a more detailed engineering survey of these areas and that these studies could then be added to this report as either a supplement or addendum.

Recreational Areas

In July, 1973, the North Central Florida Regional Planning Council prepared a report titled "Open Space and Recreation, 1973." This report presents an excellent discussion of the available and planned future parks and recreational areas to be located in Alachua County. Borrowing from this report and combining other information available, we have shown in Section 3 on Plate 3-5 the location of the new 17,000 acre state park known as Paynes Prairie located to the south of Gainesville, on Plate 3-6 the location of state and county recreational facilities, and on Plate 3-7 existing parks. As the trend of modern civilization leans toward more leisure time with desires for open spaces and natural recreation areas, the need and responsibility for a supply of adequate potable water to these recreational facilities is required.

Where it is economically feasible and usage demands it, municipal water supplies should be extended to recreational and park areas. In secluded areas of rather light usage where potable water is required, adequate deep wells and small chlorination systems for disinfection should be installed and periodic sampling provided to insure that the water supply does not become contaminated. Continued surveillance and maintenance of recreational parks and facilities is a must to insure that all residents and users of these facilities are supplied with adequate and safe potable water.

Migrant Labor Camps

Presently in Alachua County there are two permitted migrant camps, one located at the unincorporated community of Island Grove and the other near the unincorporated community of Santa Fe. It is our understanding that both of these facilities have adequate water supplies which are periodically surveyed by personnel of the County Health Department. It is our recommendation that areas which require occasional or seasonal supplies of potable water be supplied by the nearest available public potable water supply. In the event that these facilities are too far away, every safeguard should be taken toward providing a supply of potable water through properly constructed water supply facilities complete with chlorination and continued periodic checking by the County Health Department.

10.1.2 Areas of Districts Needing Adequate Water Supply

There are presently two distinct areas of the county which need an adequate public water supply. These two areas are the incorporated community of LaCrosse and the unincorporated community of Melrose. Both areas are presently remote from regional facilities but are becoming populated enough to consider installation of public water facilities.

The first step in the consideration of proper public water facilities is, as mentioned previously, to have a preliminary engineering report prepared. Both these communities should consider doing so immediately.

Other areas, such as planned unit developments, should pursue all possibilities and means by which, if economically feasible, they may be served from the regional water plants located in Gainesville. Planned unit developments not within proximity of these facilities should design adequate facilities which would be compatible with a regional facility if and when that facility were to become available.

10.2 ALTERNATE PROGRAMS FOR PROVIDING ADEQUATE WATER SUPPLY TO COUNTY RESIDENTS

In Alachua County there exists basically two types of water supplied to the residents. This water could be classified either as treated or nontreated. Treated water is supplied by the cities of High Springs and Gainesville in the form of softening and filtration. All of the other incorporated municipalities, with the exception of LaCrosse, pump their water from deep wells and chlorinate prior to being pumped into the system.

The definition of adequacy, as it pertains to public water supply, is two-fold. One condition of adequacy is sufficient quantity and the other condition is proper quality. Water supplied by all the municipalities in Alachua County, again with the exception of LaCrosse, is of acceptable quality. The waters treated by the lime softening process in Gainesville and High Springs and then filtered are, of course, of better quality than those supplied by the other six municipalities. However, these six facilities meet Public Health Service standards and the requirements of the County Health Department for public water supply. Adequacy with regard to meeting the peak demands and fire protection should be requirements of all the municipalities.

The following two sections of this report evaluate the alternatives available to meet the 1990 water supply requirements for area residents.

10.2.1 Regional System Evaluations

In this report, three alternatives for regional water systems were evaluated. The first alternative analyzed was to supply water treated in the Gainesville regional plants to

all of the incorporated municipalities and areas in between, by the regional system. The second alternative analyzed was for each incorporated municipality to construct, operate, and maintain a modern treatment plant complete with softening, filtration, recarbonation, and chlorination. The last alternative analyzed was that of each municipality supplying water from its existing facilities, with additional facilities added, to meet the needs of each community by the year 1990. Plate 10-1 shows the proposed regional system for water treatment and distribution for the present and for the future. A cost comparison and summary of the recommended water development plan are shown in Sections 10.3 and 10.4 of this report.

10.2.2 Evaluation of Adequacy of Current System on Numerous Private and Public Supplies

As stated previously, in Alachua County there are presently 140 privately owned utility systems, each serving 25 or more people. Of these, 38 are trailer parks with privately owned water systems serving 3,500 people. Another 18 systems sell water. With but a few exceptions, this water is untreated. Most of these privately owned water systems have what might be considered marginal facilities. While most of these facilities are capable of meeting average demands, they are not capable of meeting anticipated peak demands by 1990 and adequate fire protection. Most of these systems have no back-up facilities provided. It is recommended, wherever feasible, for the Regional Utilities Board to provide service to these areas and that these inadequate systems be abandoned. Until such time as this may occur, the Alachua County Health Department must police these facilities to insure that the health and safety of the residents, these systems supply, is protected.

10.3 COST COMPARISONS

This section of the report deals mainly with the cost comparison between Alternate I, of each city constructing, operating, and maintaining a new softening filtration plant and Alternate II, receiving treated water from the regional water treatment plants located in Gainesville. The final results of these two cost comparisons, as shown on Table 10-1 and Table 10-2, have been summarized in tabular form on Table 10-3. The results indicated in Table 10-3 show that for the communities of Micanopy, Archer, Newberry, High Springs, and Alachua it appears to be more economical to receive treated water, piped from the regional water treatment plants in Gainesville, than to construct and install their own treatment facilities. It is somewhat marginal for the community of LaCrosse and does not appear economical for the cities of Waldo and Hawthorne. If any of these communities were to need or desire softened, treated water, it is recommended that they follow the proposed piping installations as shown on Plate 10-1.

Please note that these cost analyses shown on Tables 10-1 and 10-2 assume no federal, state, or county financial aid in the form of a grant. Capital costs were calculated

by using today's prices escalated by 20 percent to allow for inflation. Annual costs were calculated at an assumed bond issue of 30 years at 7 percent. Debt service was considered 125 percent of the annual cost or 25 percent coverage. Annual operational costs were calculated from most recent curves published in the 1972 AWWA Journal for lime softening water treatment.

10.4 SUMMARY OF RECOMMENDED WATER DEVELOPMENT PLAN

Listed below is a summary of the recommended water development plan for Alachua County for the year 1990.

1. The city of Waldo should install, as soon as possible, a new well and water supply pump for standby purposes. The installation of this pump, as well as appropriate distribution system extensions, should be sufficient to meet Waldo's needs to the year 1990. Were the city to determine that softened water would be desirable, the city should direct its consulting engineers to again analyze the possibility of tying into the regional treatment plant versus construction of its own individual water softening plant. At this time it does not appear economical to tie into the regional water treatment facilities located in Gainesville.

2. The present facilities for the city of Hawthorne appear to be adequate to meet projected needs to the year 1990. It is recommended, however, that these facilities be maintained and the older facilities be replaced or repaired. A vigilant maintenance and water distribution extensions program should be ongoing with the city to insure the best and safest water utilities for the city and residents of Hawthorne.

3. The facilities of the Micanopy system appear to be in good shape and should be adequate to the year 1990. However, at present no standby facilities are available for supply and distribution. It is recommended that the city explore the possibility of installation of a new well. Were softened water deemed desirable by the city of Micanopy, it appears the more economical source, for this water would be pumped from the regional water treatment plant located in Gainesville. This plan is shown on Plate 10-1.

4. The existing water utility for the city of Archer, should meet anticipated needs by the year 1990. However, Archer also has no standby facilities. It is therefore recommended that a new well be constructed and placed in operation as soon as possible. Were the

city of Archer to desire softened water, it appears more economical to supply water from the regional system in Gainesville than for Archer to construct its own softening plant. A 12-inch water main from the extent of the regional water system in Gainesville to Archer, along the Archer Road, should meet these needs until 1990.

5. The existing water facilities for the city of Newberry appear to be adequate to meet the needs to the year 1990. However, these facilities are in need of repair and perhaps replacement and updating. It is therefore recommended that Newberry pursue a vigorous replacement and renewal program, as well as continued adequate extensions to its distribution system. If the city of Newberry were to request softened water, it would be more economically supplied from the regional treatment facilities in Gainesville than construction of a softening plant in Newberry.

6. The present water treatment plant facilities in High Springs will be adequate until 1977. One immediate problem facing High Springs is that present water quality of the existing wells is poor and that the treatment plant is in need of better maintenance and repairs. With capacity soon to be exceeded, three alternatives exist for High Springs. The first would be to obtain treated water from the regional water treatement plant. The second would be to install a new plant expansion to the existing plant and update, repair, and modernize the existing plant. The third would be to consider installation of a new well field and find water of a better quality in lieu of expanding the existing treatment facilities. Because these three alternatives exist, we recommend that the city's consulting engineers prepare a report for presentation of these alternatives to the city of High Springs. The recommendation from that report, upon approval of the Regional Planning Council, could be added to this report by addendum.

7. Present facilities located in the city of Alachua appear to be adequate to the year 1980. At that time a new well will be needed. Prior to installation of this well Alachua should determine if softened water is desirable. If so, it would be more economical for this water to be supplied from the regional water treatment plant in Gainesville than for Alachua to construct their own treatment facility.

8. Presently LaCrosse has no public water supply. It is recommended that LaCrosse obtain the services of a consulting engineer and that they have prepared a preliminary engineering report for a public

water system in LaCrosse. If LaCrosse were to desire softened water, it appears that this water could best be supplied from the regional system located in Gainesville.

9. The city of Gainesville's water treatment plants should be adequate to meet the needs to the year 1990. The installation of the new 30-mgd water treatment plant, located north of town, in addition to the existing water treatment plant, will be capable of supplying a maximum of 55 mgd of treated water. When the new 30-mgd treatment plant goes into service, the existing 15-mgd treatment plant could be repaired and maintained in a state of readiness. It is anticipated that this plant will have to be used to supply treated water before the year 1990. Shown on the solid lines on Plate 10-1 are major water distribution mains which should be installed as soon as possible. The 16-inch line on U.S. 441 from SR 121 to the new Deer Haven power plant has already been installed. Before actual construction drawings were prepared for the installation of these facilities, it was recommended that an update of the water distribution section of the Gainesville Ten Year Master Plan submitted by the city's consultants in 1965 be prepared. This report should contain a complete Hardy-Cross analysis of the entire distribution system so that areas of low pressure could be remedied by recommended improvements and that future facilities could be sized accordingly.

10. As the distribution system extends out from the Gainesville urban area, many unincorporated areas of Alachua County will be able to be supplied with treated water from the water main extensions. In other areas where these facilities will not become available within the planning scope of this report, proper disinfection of the water and maintenance of existing facilities should be required. It is hoped that by the extension of these transmission and distribution systems, in the future, all residents of Alachua County will have available an adequate treated and softened water supply.

TABLE 10-1

ALTERNATE I—REGIONAL WATER TREATMENT FACILITIES FOR ALACHUA COUNTY

City	Waldo	Hawthorne	Micanopy	Archer	Newberry	High Springs	Alachua	LaCrosse
1990 Population	1,075	1,639	1,097	1,465	2,250	4,450	5,825	750
Average Daily Flow (gpd)	110,000	165,000	110,000	150,000	225,000	445,000	585,000	75,000
Peak Treatment Rate (gpd)	302,500	453,750	302,500	412,500	618,750	590,150	1,606,750	206,250
Plant Cost	$380,000	$518,000	$380,000	$480,000	$655,000	$655,000	$1,093,000	$318,000
Annual Cost	30,623	41,744	30,623	38,681	52,784	52,784	88,081	25,626
Debt Service	38,279	52,180	38,279	48,352	65,980	65,980	110,101	32,033
Annual O&M	23,432	26,443	23,432	25,676	29,783	39,364	43,826	21,023
Total Annual Cost	61,700	78,600	61,700	74,000	95,800	105,300	153,900	53,100

TABLE 10-2

ALTERNATE II—REGIONAL WATER TREATMENT FACILITIES FOR ALACHUA COUNTY

City	Waldo	Hawthorne	Micanopy	Archer	Newberry	High Springs	Alachua	LaCrosse
1990 Population	1,075	1,639	1,097	1,465	2,250	4,450	5,825	750
Average Daily Flow (gpd)	110,000	165,000	110,000	150,000	225,000	445,000	585,000	75,000
Peak Treatment Rate (gpd)	302,500	453,750	302,500	412,500	618,750	590,150	1,606,750	206,250
Peak Rate (gpm)	210	315	210	286	430	410	1,116	143
Pipe Size (in)	12	12	12	12	12 16	12 16	16	12 16
Length of Pipe (ft)	50,000	60,000	39,000	40,000	27,000 24,000	35,000 37,000	37,000	35,000 37,000
Percent of Pipe Used	100	100	100	100	100 75	100 40	53	100 7
Cost of Pipe	$600,000	$720,000	$468,000	$480,000	$324,000 288,000	$420,000 237,000	$314,000	$420,000 41,000
Cost of Booster Station	25,000	25,000	25,000	25,000	25,000	30,000	30,000	25,000
Treatment Cost Regional Water Plant	50,000	75,000	50,000	68,000	103,000	98,000	267,000	34,000
Total Cost Treat and Pump	675,000	820,000	543,000	573,000	740,000	785,000	611,000	520,000
Annual Cost	54,400	66,100	43,800	46,200	59,600	63,300	49,200	41,900
Debt Service	68,000	82,625	54,750	57,750	74,500	79,125	61,500	52,375
Annual O&M	4,000	6,065	4,000	5,560	8,252	12,896	21,387	2,700
Total Annual Cost	72,000	88,700	58,800	63,300	82,800	92,000	82,900	55,100

TABLE 10-3

SUMMARY OF WATER FACILITIES PLAN

City	Alternate I	Alternate II
Waldo	$ 61,700	$72,000
Hawthorne	78,600	88,700
Micanopy	61,700	58,800
Archer	74,000	63,300
Newberry	95,800	82,800
High Springs	105,300	92,000
Alachua	153,900	82,900
LaCrosse	53,100	55,100

PUBLIC WATER SUPPLIES

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PUBLIC WATER SUPPLY - ALACHUA COUNTY

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS

SECTION 11

SANITARY FACILITIES PLAN

11.1 GENERAL

As with the water facilities plan, the need for sanitary facilities for the people of Alachua County must be answered. Unlike the water facilities in Alachua County, only one of the nine incorporated communities has adequate wastewater collection, treatment, and disposal. This incorporated municipality is the city of Gainesville. The city of Waldo is the only other city providing public sanitary facilities. However, their treatment system is grossly inadequate. The remaining eight incorporated municipalities have either privies or septic tanks with the large flow users such as hotels, restaurants, and service stations, primarily located along major thoroughfares being served by small packaged plants.

In most typical rural communities, the installation of sanitary sewers and treatment facilities for public service is generally preceded by the construction and installation of public water facilities. This is very typical of Alachua County in that all but one of the incorporated municipalities has a public water supply and only one, Gainesville, has adequate public wastewater treatment facilities. The principal reason for this situation is due to the simplicity of small water systems as compared to small treatment facilities. Cost is another related factor in that water systems usually cost less than equivalent sewer systems.

These factors, when applied to the rural communities and the small unincorporated cities of Alachua County, tend to encourage the implementation of water supply systems and discourage implementation of publicly owned centralized wastewater treatment facilities. Existing and proposed land uses, as well as projected population and population density estimates, emphasize the need for the installation of proper publicly owned sanitary sewer facilities. Unlike the water facilities plan, the sewer facilities plan analyzes in great detail the possibility of centralization of treatment facilities for wastewater in Alachua County.

11.1.1 Geographical Locations

The following paragraphs contained in this section will analyze the existing sanitary facilities and include a summary of conditions and adequacy of each. Recommended improvements, alternate programs, cost, and comparisons are included. A summary of the recommended sewer development plan is shown in Section 11.4.

Waldo

Shown below is a summary of data on the existing sanitary facilities for Waldo.

Area Sewered (Acres)	85
Total Connections (Estimated)	100
Linear Feet of Sewer	14,100
Houses Per Acre	3.08
City Area (Acres)	1,140
Percent of City Area Sewered	7.50

The present wastewater treatment facility for the city of Waldo is a 40,000-gallon septic tank. This tank is made of reinforced concrete and is 50 feet long by 15.30 feet wide by 7 feet deep. Four manholes are located on top of the tank to allow for inspection and periodic pumping of accumulated sludge.

The septic tank is located 600 feet east of U.S. 301 on the extension of North Street.

A 10-inch vitrified clay sewer serves as an outfall line from the septic tank and extends eastward 385 feet to a drainage ditch. This drainage ditch runs eastward for 380 feet to the drainage ditch along the Seaboard Coastline Railroad right-of-way.

As can be seen from this information, the sanitary facilities for the city of Waldo are inadequate in treatment. By 1990, the projected population of Waldo is to be in excess of 1,000. Therefore, adequate collection and treatment facilities need to be constructed.

Recommended improvements for the city of Waldo are the installation of an adequate collection system, pumping stations, force mains, and a modern efficient wastewater treatment facility capable of handling 110,000 gpd of wastewater flow projected for the year 1990.

In July, 1970, an engineering report entitled, "Master Plan for Wastewater System Improvements for the City of Waldo" was submitted to the city by the engineering firm of Black, Crow and Eidsness. This report contained cost estimates for phased construction of sanitary facilities for the city of Waldo. The proposed cost of these facilities was estimated at $500,000. It is recommended that this engineering report be updated based on projected flows to 1990 and present day construction costs. Also, the possibility of spray irrigation should be explored and a potential site selected of no less than 20 acres.

If feasible, it is recommended that the site of the wastewater treatment plan be located south of Waldo. These facilities should be constructed so that they can be phased out and a master pumping station installed which will pump to a regional wastewater treatment plant located in Gainesville.

Hawthorne

Presently the city of Hawthorne has neither a collection nor a publicly owned wastewater treatment facility. Because the community has no sanitary treatment facility, each building must rely upon individual septic tanks or outdoor privies. In most parts of the city, the soil and groundwater conditions are considered unsuitable for proper septic tank operation. Due to the lack of adequate wastewater disposal, a potential public health hazard has been created and as growth in the community continues, problems will become more acute. Also, the absence of a proper public sanitary treatment system discourages industry and significant commercial establishments which may be giving consideration to locating in Hawthorne.

A preliminary engineering report, "A Sanitary Sewerage Program for the City of Hawthorne, Florida," prepared June, 1966, by David B. Smith, Engineers, of Gainesville, Florida, outlined the proposed treatment facilities. The engineering report projected that by 1990 the average daily flow for projected sewer connections of 560 would be 200,000 gpd. This flow is only 35,000 gpd below the flow which we have projected from the 1990 estimated population in this report. The projected project cost for treatment in the engineering report is $106,400 and for collection systems is estimated at $430,400.

The following are recommendations for the city of Hawthorne:

1. The engineering report should be updated keeping in mind today's more stringent requirements on wastewater treatment and also the increased cost of installation of sanitary facilities.

2. The possibility of treated wastewater effluent spray irrigation should be explored and a potential site be selected of no less than 25 acres.

3. That, if feasible, the site of the wastewater treatment plant should be located west of Hawthorne and that the facilities be constructed such that in the future the wastewater treatment facilities could be phased out and a master pumping station be installed which will pump to a regional wastewater treatment plant located in Gainesville.

Micanopy

The city of Micanopy presently has neither a collection system nor a public wastewater treatment facility. Also, there is presently no available engineering report on proposed or planned facilities. As the community of Micanopy continues to grow, and attract such things as a recreational center where large volumes of waste are generated, the need for sanitary facilities becomes very apparent. Presently, as in all of the rural communities of Alachua County, inadequate facilities such as privies and septic tanks are being used. These facilities, while they serve a useful purpose, constitute a potential public health hazard.

We recommend that Micanopy explore the possibilities of an engineering report which would show a recommended collection system, treatment facility, and cost estimate.

Archer

In the 1967 Comprehensive Water and Sewer Plan, it was indicated that certain outlying areas of Archer presently are favorable for the use of septic tanks. Within the city though, in the more densely populated areas, public collection and treatment facilities should be provided. The 1967 report recommended that the city secure a preliminary engineering report as the first step in developing its treatment facility program. The city has recently had this report prepared by the engineering firm of Sverdrup and Parcel, formerly Smith, Davis and Associates. This report entitled "Engineering Report for a Wastewater Program for the City of Archer" was submitted in June, 1972. We have projected the average wastewater flow, by the year 1990, to be 150,000 gpd which closely correlates the projected flow in the Smith, Davis report. However, the size of their plant was projected to the year 2010 and estimated to have a capacity of 200,000 gpd. The projected cost of the wastewater collection system for the city of Archer, with prices escalated to 1975, was $706,000. The estimated construction of the wastewater treatment and disposal facilities, with prices escalated to 1975, was $327,000. If facilities are constructed just to meet the 1990 population, we project a cost of $276,000.

We recommend that the city of Archer explore the possibility of installing the facilities as outlined in their consultant's engineering report and suggest that the following modifications be considered:

1. Location of the wastewater treatment facility on the northeast side of the city limits in lieu of the southwest side as shown on the engineering report. This would facilitate ease in tying into the regional system if, in the future, this connection were considered.

2. The master pumping station which pumps wastewater to the treatment plant be designed so it could easily be converted to a master pumping station which could pump to the Kanapaha Regional Plant in Gainesville when economically feasible.

3. If a plant is placed in Archer that it be of such design that it is reasonably portable and could be easily be moved to another location for use if and when connection to the regional system is deemed desirable.

Newberry

The city of Newberry, following the recommendations of the 1967 Comprehensive Water and Sewer Plan, employed the consulting services of Glace and Radcliff, Incorporated, Consulting Engineers from St. Petersburg and Winter Park. In April, 1970, the engineers reported to the city of Newberry in a report entitled "Planning and Feasibility Report on Sanitary Sewerage Facilities." Presently, implementation of the report is underway with construction drawings for the collection system and treatment plant being prepared. We compliment the city for their farsightedness in the authorization of the treatment program. In view of the previous discussion, we recommend the following:

1. That the proposed wastewater treatment plant be located and designed so the master pumping station can be easily converted to the regional plant in Gainesville.

2. Prior to construction of the wastewater treatment plant, serious consideration be given to the possibility of pumping wastewater for treatment to the regional plant in Gainesville in lieu of constructing a treatment plant in Newberry.

High Springs

The city of High Springs is presently served by individual septic tanks and has neither public collection nor treatment facilities. Projected population to the year 1990 is 4,450.

The city of High Springs, following the recommendations of the 1967 report, hired the engineering firm of Smith and Gillespie of Jacksonville, Florida. They prepared a preliminary report for a sanitary treatment system for High Springs, Florida, dated May, 1970. This report outlines the existing sanitary conditions, the proposed improvements, and gave preliminary estimates of the project cost. An excerpt from the engineering report stated the existing sanitary conditions as follows:

The present facilities for the disposal of sewage in the city of High Springs is generally limited to privately owned septic tanks and drain fields. In some instances where population density is light, the soil conditions are suitable for proper percolation, and there is sufficient area to develop the required drain fields, septic tanks can provide a satisfactory method of sewage disposal. However, as the population density increases and more septic tanks are installed, the area available for drain fields becomes limited and the effectiveness of the septic tank is increasingly reduced. When this condition is accompanied by soil conditions that are not conducive to efficient drain field operation or where the substrata may allow rapid transfer of the drain field effluent to the underlying water supply aquifer, the situation may become a serious health hazard.

As previously noted, the topography in High Springs is accented by numerous sinkholes. These sinkholes are formed as a result of storm water penetrating and dissolving the underlying limerock formation, the deeper zones of which form the water supply aquifer for the city. In the areas between sinkholes, soil conditions vary from sand to relatively impervious limerock formations.

Investigation and analysis of the distribution of present housing and commerical establishments within the city indicates that several areas have now reached the stage of development that warrant the City giving serious consideration to the provision of modern sanitary sewage collection and disposal facilities to assure the continued good health and well being of its citizens.

The estimated cost from their report was for a collection system, only in the areas having sufficient population to warrant sewer installation, and does not include work in sparsely populated areas of the city. The total construction cost for installation of the collection system was estimated at $3,610,585. The projected cost of the wastewater treatment plant was $170,000. This plant was designed to serve a population of 3,500.

As the city of High Springs continues to grow, need for the installation of these facilities will become more acute. Delay in installation of these facilities will only mean increased cost in construction and continued groundwater pollution from septic tank discharges. Due to these conditions, as well as the numerous sinkholes located around High Springs and close proximity to the Santa Fe River, we recommend the following:

1. That the May, 1970, engineering report of Smith and Gillespie be updated and that construction of the collection system be implemented as soon as practical.

2. That consideration be given to locating the wastewater treatment plant to the southeast of the city limits instead of as shown located

to the northwest close to the Santa Fe River with discharge to the Santa Fe River.

3. We recommend that the master pumping station to the treatment plant be designed so it could be easily converted to pump wastewater to a potential regional pumping station in Alachua.

4. That in lieu of construction of the wastewater treatment plant, consideration be given to pumping raw wastewater to a regional pumping station in Alachua for further transport to the Kanapaha Regional Wastewater Treatment Plant located in Gainesville.

5. That if a wastewater treatment plant is constructed it either have teritary treatment capabilities to enable best discharge possible to the Santa Fe River or be located in such an area as to allow spray irrigation of treated effluent.

Alachua

The city of Alachua has a projected population by 1990 of 5,825. This will make Alachua the next to largest incorporated municipality in Alachua County by 1990, second only to the city of Gainesville. The city of Alachua has had prepared, by the engineering firm of Black, Crow and Eidsness, an engineering report entitled "Wastewater Collection System and Treatment Facilities for the City of Alachua, Alachua, Florida." This project is the most recent report for sanitary facilities in Alachua County and is dated July, 1973. Population, however, for this engineering report was projected to the year 1985. The program as outlined in the report was phased for immediate and deferred construction. The city has elected to install the collection systems of both the immediate and deferred construction. The total cost of the collection system is estimated at $1,480,344. The estimated cost of the treatment plant is $589,000. The total program including technical, legal, and administrative cost is an estimated $2,154,271. Presently the city of Alachua has authorized its engineers to proceed with the preparation of plans and specifications for the collection system and wastewater treatment plant. The city has also authorized its fiscal agents to proceed with the preparation of the financial documents necessary for the funding of the project. We recommend that the city of Alachua continue with their system and compliment them on their decision to install the modern wastewater collection and disposal facility. We recommend also the following be considered:

1. That the master pumping station which will pump to the wastewater treatment plant be designed so it could easily be converted to a regional pumping station capable of pumping to the Kanapaha Regional Treatment Plant located in Gainesville.

2. That prior to construction of the plant the possibility of pumping raw wastewater to the regional treatment plant in Gainesville be explored instead of construction of the wastewater treatment facility in Alachua.

LaCrosse

The projected population for the city of LaCrosse in 1990 is 750. Presently, the city is served with individual septic tanks and drain fields. LaCrosse, like Micanopy, does not have an engineering report to determine the feasibility of installation of public treatment facilities in the community. As a first step towards the abatement of potential groundwater pollution by the existing facilities, it should be the responsibility of the city to authorize a preliminary engineering report to determine the particulars and the estimated cost of installation of public treatment facilities. We do not recommend at this time that the city of LaCrosse entertain the possibility of installation of a collection system and a master pumping station pumping wastewater to the regional treatment plant or a regional pumping station located in Alachua. The annual costs derived in Section 11.4 show that, due to the small projected population and lower annual cost, it is more cost effective to install a small packaged plant in LaCrosse than to pump the small amount of flow to a regional system. Were the city of LaCrosse to pursue the installation of public treatment facilities, the projected size of the plant for 1990 would be 75,000 gpd capacity.

Gainesville

The present wastewater system serves practically all of the Gainesville urban area except some outlying areas incorporated by annexation in 1962. There are approximately 70 wastewater pumping stations which pump through a system of force mains to the wastewater treatment plant. Present treatment facilities consist of a 5-mgd high rate trickling filter plant and the recently completed 4.5-mgd contact stabilization plan, both are located on the same site on South Main Street in Gainesville.

In addition, the city owns a third treatment plant located near the Gainesville Golf and Country Club to the southwest. This is an extended aeration plant with a nomial capacity of 55,000 gallons per day.

Improvements completed since 1967 include construction of wastewater Pumping Stations No. 1 and 10, force mains and gravity sewers, and the new 4.5-mgd wastewater treatment plant. Work has been completed on interceptors, force mains, and three pumping stations to serve the Bivens Arm area and Santa Fe Community College.

Present water quality standards of the state of Florida require that the owners of all wastewater treatment facilities provide at least 90 percent BOD removal as

"expeditiously as possible" and before January 1, 1973. In some cases, tertiary treatment will be required, dependent upon local conditions as determined by the state.

The wastewater treatment plant addition of the contact stabilization, activated sludge type has consistently met the 90 percent BOD removal requirement.

A Ten Year Master Plan for the wastewater system has been prepared by Black, Crow and Eidsness and submitted to the City Commission. Improvements recommended in that report were modified in a supplemental report to provide for required and necessary environmental considerations. Acting on the recommendations of the aforementioned reports, the City Commission authorized wastewater system improvements consisting of a new 7-mgd advanced wastewater treatment plant, new force mains, and new treatment units at the existing plant. Construction of these new facilities will begin during early 1974. The new treatment plant will be located on the recently acquired property at Lake Kanapaha.

The projected population of the Gainesville urban area by 1990 is 192,099. Assuming that this entire population were connected to the collection system a total treatment plant capacity of approximately 19.5 mgd would be required. Present capacity consists of 9.5 mgd at the existing Main Street Plants No. 1 and 2. When completed in 1975, the new Kanapaha Plant will have an initial capacity of 7.0 mgd. Therefore, it is apparent that prior to 1990 an additional 3 mgd of capacity will need to be installed. The exact size of this facility can be determined a few years prior to when the need for this facility becomes a reality. With the present land available and with population migrating westward, the Kanapaha Plant could easily be expanded.

Melrose

The unincorporated community of Melrose, typifing a majority of the incorporated and unincorporated rural communities, also has no public treatment system. Again, soil water table conditions appear to be unsuitable for the use of septic tanks. Melrose's problem is not only a public health hazard but also many of the homes in Melrose are located on Melrose Bay adjacent to Santa Fe Lake. This situation could lead to degradation of the waters of the lake caused by improperly treated waste entering the lake's waters through septic tank discharges. The community of Melrose has neither public wastewater treatment facilities nor a public water supply. Because of population density in the Melrose area and the potential problems created by the lack of public facilities we strongly urge Melrose to have prepared, by a consulting engineer, a preliminary water and wastewater facilities report.

Unincorporated Communities

Of the 13 unincorporated communities in Alachua County, all are considered densely enough settled that public wastewater facilities, as well as public water facilities,

should be provided. The installation of these facilities would go toward promoting health, protecting property values, and in the case of the communities located near lakes, retarding possible degradation and eutropication of the lake. In the absence of a detailed engineering report, it appears that the communities of Fairbanks, Windsor, Rochelle, and Wacahoota could have their treatment needs taken care of by pumping to the regional treatment plant located in Gainesville. The growth of Gainesville's urban area east around the Newnans Lake area could make this an economically feasible solution prior to 1990 for the two communities of Windsor and Rochelle. The Gainesville collection system extends as far north as the industrial park area at the Gainesville Airport making this collection system within easy access to the potential service accounts in the city of Fairbanks. Earlton and Orange Heights, were they to install collection facilities, might give consideration to pumping wastewater to Waldo for either transmission or treatment. Campville and Grove Park, were they to install facilities, could consider the possibility of pumping raw wastewater to Hawthorne for treatment. If a collection system were installed in Hague, the possibility of pumping wastewater to Alachua should be explored. If and when facilities are available in LaCrosse, the community of Santa Fe might consider pumping wastewater for treatment to LaCrosse. Were facilities installed in Wacahoota, consideration should be given to pumping the wastewater north along the Williston Road to Gainesville for treatment. In the southeast section of the county, Cross Creek, Lochloosa, and Island Grove might give consideration to installation of collection systems and pumping facilities at a centrally located treatment plant to serve all three communities.

At present, no detailed engineering reports are available for any of these unincorporated communities. Because no engineering reports exist for wastewater facilities and water facilities, we strongly recommend that before any consideration of installation of facilities be decided upon that an engineering report be prepared covering aspects of both water supply and wastewater treatment.

Recreational Areas

Of the 13 county owned recreational facilities and the four state owned recreational facilities, all are either on or near surface bodies of water. Due to this fact, it becomes increasingly apparent that adequate sanitary facilities be provided at each one of these locations. As with the small unincorporated communities, such is true of the recreational facilities that both water and wastewater needs should be analyzed in one engineering report.

Because of the increased use of recreational facilities, it is essential that temporary waste facilities be installed until the county can make provision for a more permanent installation.

Migrant Labor Camps

Due to the nature of migrant labor camps, they are usually not close to permanent sanitary facilities. Migrant labor camps contain a varying and seasonal population and, when required, adequate sanitary facilities should be made available to provide for the health and welfare of these workers. These facilities should be adequate in number, be within easy access of all workers, and should be regularly serviced. Also provided with these temporary sanitary facilities should be an adequate potable water supply complete with necessary toiletry for hygienic purposes. In areas where a large number of workers and their families live from season to season, the possibility of permanent facilities should be explored. When population density warrants, a preliminary engineering report should be prepared analyzing the feasibility of installation of a separate treatment facility versus installation of a pumping system to the nearest regional plant.

11.1.2 Areas or Districts Needing Collection Systems and Construction Timetables

Collection systems are needed in all the incorporated municipalities except for Waldo and Gainesville. Waldo's system needs to be expanded. The cities of Newberry and Alachua have programs underway for the installation of these facilities. Construction drawings will soon be prepared for these systems. If funded, the facilities could be installed starting in 1974. Engineering reports have been prepared for Hawthorne, Archer, and High Springs. Cost of the proposed collection and treatment facilities lead these communities to defer construction drawings being prepared. The cities of Micanopy and LaCrosse still need preliminary engineering reports.

11.2 EVALUATION OF ALTERNATE PLANS TO IMPLEMENT THE MOST EFFICIENT AND COST EFFECTIVE PROGRAM OF REGIONAL WASTEWATER UTILITIES

Six alternates were arrived at for consideration as the most logical for a regional approach toward supplying wastewater treatment facilities.

Alternate I, shown on Plate 11-1, considered an individual installation at each municipality or, if you will note, a regional plant at each population center.

Alternate II, shown on Plate 11-2, considered only two regional plants located in the center of the county in Gainesville. The one existing plant is located on South Main Street and has a capacity of 9.5 mgd. The second plant, soon to be constructed, will be located near Lake Kanapaha, west of Gainesville, and will have an initial capacity of 7 mgd.

3. Force mains, unlike water mains, are not easily connected into by individual users along their path.

Under this alternate, however, marginal costs occur for the cities of Archer, Newberry, High Springs, and Alachua. Due consideration towards pumping into the regional plant at Kanapaha should be given by these communities before a treatment plant of their own were constructed. A further discussion of this alternate appears under cost comparisons, Section 11.3.

11.2.2 Evaluation of Wastewater Treatment Systems Designed to Serve More Than One Municipality

Alternates III, IV, V, and VI, shown on Plates 11-3 through 11-6, show possible combinations of regional plants to serve more than one community. The results of the cost of analysis of these alternates show that the cost advantage gained by somewhat lower operational and maintenance costs is lost by the cost of the pumping stations and force mains to get to the regional plants. Only one Alternate IV, deserves some discussion. Under this alternate, an annual cost savings of $9,200 is gained by Alachua if a regional plant were located there to serve itself, High Springs, and LaCrosse. This cost savings, however, is lost by an increased cost of $19,700 per year for High Springs and $16,500 per year for LaCrosse. Therefore, it is concluded, after a comparison of the annual costs shown on Table 11-7 for Alternates III, IV, V, and VI, that regional plants which attempt to serve more than one municipality do not appear economically feasible within the projected planning date of 1990.

11.3 COST COMPARISONS

Tables 11-1 through 11-6 show the calculations used in determining the annual costs for each alternate analyzed. A summary of these annual costs is tabulated on Table 11-7.

A review of Table 11-7 shows that the least annual cost for providing wastewater treatment facilities appears under the column entitled Alternate I for all the municipalities except Alachua and Newberry. The least annual cost for Newberry appears under Alternate II and the least cost for Alachua appears under Alternate IV. A closer examination of these two alternates reveals that the annual costs would be lower only by combining with, and at the expense of other communities.

Therefore, the following should be analyzed.

1. If Newberry, High Springs, and Alachua treat their waste independently, the sum of the total annual costs is $295,400. If these cities combine and pump to the Gainesville Regional Plant, the

sum of the total annual costs is $302,200 or a difference of $6,800 annually in favor of individual plants in each city.

2. If High Springs, Alachua, and LaCrosse were to treat their waste combined at Alachua, the sum total annual costs would be $286,100 annually. Separate treatment would be an annual sum of $259,100 or an annual savings of $27,000.

3. One other alternate which is not shown, but was given consideration, would be a regional plant located between Alachua and High Springs for these two communities and for Newberry to pump to the regional plant in Gainesville. The combined annual cost for the Alachua-High Springs plant is $257,300 versus $226,300 for individual treatment of waste at each city. The annual cost for Newberry to pump to Gainesville is $78,200 compared to $69,100 for individual treatment.

As with the water plan, the same basis for cost calculation was used. They are as follows: population projections were the expected high 1990 populations of the Regional Planning Council 1972 Population and Economic Report. Capital costs were calculated from present day costs escalated 20 percent. Capital costs for waste treatment at Kanapaha were figured using the anticipated construction cost less the federal grant received for that plant. Operation costs were calculated from existing operation costs of comparable facilities and include all necessary operation and maintenance, billing and administrative costs. Annual costs were calculated at 30 years and 7 percent interest with coverage for bonds of 25 percent.

11.4 SUMMARY OF RECOMMENDED SEWER DEVELOPMENT PLAN

1. The cities of Waldo and Hawthorne need to have their preliminary engineering reports updated and consideration given to financing these systems. At this time, and within the 1990 planning period, it appears more economical for individual treatment facilities to be located in these communities than to pump to a regional plant.

2. Micanopy and LaCrosse need to have preliminary engineering reports prepared.

3. For the communities of Archer, Newberry, High Springs, and Alachua, it appears somewhat marginal in annual cost between the alternates of individual treatment versus pumping to the Kanapaha regional plant. Consideration towards pumping to the regional plant should be given prior to construction of individual plants.

4. The smaller, rural, unincorporated communities should give consideration towards a preliminary engineering report to determine the feasibility of provisions of sanitary facilities and water facilities. The community of Melrose should give this serious consideration due to population density and proximity to Santa Fe Lake.

5. In view of the fact that Newberry and Alachua have construction drawings underway for their systems another consideration which might be given would be installation of interim packaged plants that are portable. These portable plants could then be easily moved and reinstalled in other expanding areas of need when the existing user diverted flow to the Gainesville regional plants.

6. We recommend that prior to construction, future wastewater treatment facilities should be reviewed by the Regional Planning Council and the Regional Utilities Board.

In this report, with flows projected to 1990, a strict interpretation of the cost analysis indicates that the installation of centrally located (Gainesville) facilities is not cost effective when compared to decentralized or individual municipal systems. However, for Archer, Newberry, High Springs, and Alachua the decision on pumping to Gainesville versus constructing their own facilities appears marginal. Before a decision on which course to pursue, other concerns, such as political inclination and Regional Utilities operational preferences should be given consideration. The recommendations of this report consider only the engineering economics and do not include these extraneous concerns.

TABLE 11-1

ALTERNATE I--REGIONAL WASTEWATER FACILITIES IN ALACHUA COUNTY

City	Waldo	Hawthorne	Micanopy	Archer	Newberry	High Springs	Alachua	LaCrosse
1990 Population	1,075	1,639	1,097	1,465	2,250	4,450	5,825	750
Design Flow (gpd)	110,000	165,000	110,000	150,000	225,000	445,000	585,000	75,000
Construction Cost of Treatment Plant	$215,100	$244,300	$215,100	$230,100	$279,000	$360,000	$438,000	$190,300
Project Cost of Plant (Increase 20%)	258,000	293,000	258,000	276,000	335,000	432,000	526,000	228,000
Land Required (Acres)	20	25	20	25	35	70	90	15
Estimated Cost of Land	$ 40,000	$ 50,000	$ 40,000	$ 50,000	$ 70,000	$140,000	$180,000	$ 30,000
Spray Irrigation Cost	11,000	17,000	11,000	15,000	23,000	45,000	59,000	8,000
Total Project Capital Cost	309,000	360,000	309,000	341,000	428,000	617,000	765,000	266,000
Annual Cost	24,901	29,011	24,901	27,480	34,491	49,722	61,649	21,436
Annual O&M	20,000	23,000	20,000	22,000	26,000	39,000	48,000	6,000
Annual Debt Service (25% Coverage)	31,100	36,300	31,100	34,400	43,100	62,200	77,100	26,800
Total Annual Cost	51,100	59,300	51,100	56,400	69,100	101,200	125,100	32,800

TABLE 11-2

ALTERNATE II—REGIONAL WASTEWATER FACILITIES IN ALACHUA COUNTY

City	Waldo	Hawthorne	Micanopy	Archer	Newberry	High Springs	Alachua	LaCrosse
1990 Population	1,075	1,639	1,097	1,465	2,250	4,450	5,825	750
Design Flow (gpd)	110,000	165,000	110,000	150,000	225,000	445,000	585,000	75,000
Design Flow (gpm)	76	115	76	104	156	309	406	52
Length of Pipe (ft)	50,000	71,000	45,000	43,000	35,000 13,000	35,000 48,000 13,000	48,000 13,000	35,000 48,000 13,000
Size of Pipe (in)	6	6	6	6	6 10	8 10 10	10 10	6 10 10
Percent of Pipe Used	100	100	100	100	100 17	100 40 33	53 44	100 7 6
Cost of Pipe	$325,000	$461,500	$292,500	$279,500	$227,500 18,785	$262,500 163,200 36,465	$216,240 48,620	$227,500 28,560 6,630
Cost of Pump Station	50,000	60,000	50,000	60,000	52,500	65,000	78,000	44,500
Total Cost of Pumps and Pipes	375,000	521,500	342,500	339,500	298,785	527,165	342,860	307,190
Project Cost of Pumps and Pipes (Increase 20%)	450,000	626,000	411,000	407,000	359,000	633,000	411,000	369,000
Project Cost of Treatment	56,545	86,211	57,702	77,059	118,350	234,070	306,395	39,450

TABLE 11-2 – *Continued*

City	Waldo	Hawthorne	Micanopy	Archer	Newberry	High Springs	Alachua	LaCrosse
Total Project Cost	$506,545	$712,211	$468,702	$484,059	$477,350	$867,070	$717,395	$408,450
Annual Cost	40,821	57,395	37,771	39,009	38,468	69,874	57,812	32,916
Annual Debt Service (25% Coverage)	51,000	71,700	47,200	48,800	48,100	87,300	72,300	41,100
Annual O&M Pumps and Pipes	6,328	6,153	6,153	4,401	9,306	9,831	21,745	4,226
Annual O&M Regional Treatment Plant	4,607	7,024	4,701	6,279	9,643	19,071	24,964	3,214
Total Annual Cost	61,900	84,900	58,100	59,500	67,000	116,200	119,000	48,500

TABLE 11-3

ALTERNATE III—REGIONAL WASTEWATER FACILITIES IN ALACHUA COUNTY

City	Waldo	Hawthorne	Archer	Newberry	High Springs	Alachua	LaCrosse
1990 Population	1,075	1,639	1,465	2,250	4,450	5,825	750
Design Flow (gpd)	110,000	165,000	150,000	225,000	445,000	585,000	75,000
Design Flow (gpm)	76	115	104	156	309	406	52
Length of Pipe (ft)	39,500	39,500	43,500 15,200	26,300 15,200	35,000 41,500	41,500	35,000 41,500
Size of Pipe (in)	6	6	6 8	6 8	8 10	10	6 10
Percent of Pipe Used	100	100	100 40	100 60	100 40	53	100 7
Cost of Pipe	$256,750	$256,750	$282,750 45,600	$170,950 68,400	$262,500 141,100	$187,000	$227,500 24,650
Cost of Pump Station	70,000	80,000	80,000	52,500	65,000	78,000	44,500
Total Cost of Pumps and Pipes	326,750	336,750	408,350	291,850	468,600	265,000	296,650
Project Cost of Pumps and Pipes (Increase 20%)	392,000	404,000	490,000	350,000	562,000	318,000	356,000
Project Cost of Treatment	154,000	231,000	116,000	174,000	344,000	452,000	58,000
Land Cost	36,000	54,000	47,635	71,453	141,318	185,777	23,817

TABLE 11-3 — *Continued*

City	Waldo	Hawthorne	Archer	Newberry	High Springs	Alachua	LaCrosse
Total Project Cost	$582,000	$689,000	$654,000	$595,000	$1,047,000	$956,000	$438,000
Annual Cost	46,901	55,520	52,700	47,950	84,370	77,040	35,297
Annual Debt Service (25% Coverage)	58,627	69,400	65,875	59,938	105,463	96,300	44,121
Annual O&M Pumps and Pipes	4,575	4,225	4,225	4,750	9,825	18,575	4,225
Annual O&M Regional Treatment Plant	11,617	17,426	10,000	15,000	29,660	39,000	5,000
Total Annual Cost	74,800	91,100	80,100	79,700	145,000	153,900	53,300

TABLE 11-4

ALTERNATE IV—REGIONAL WASTEWATER FACILITIES IN ALACHUA COUNTY

City	Archer	Newberry	High Springs	Alachua	LaCrosse
1990 Population	1,465	2,250	4,450	5,825	750
Design Flow (gpd)	150,000	225,000	445,000	585,000	75,000
Design Flow (gpm)	104	156	309	406	52
Length of Pipe (ft)	29,000	29,000	35,000	5,000	35,000
Size of Pipe (in)	6	6	8	10	6
Percent of Pipe Used	100	100	100	100	100
Cost of Pipe	$188,500	$188,500	$262,500	$ 42,500	$227,500
Cost of Pump Station	40,000	45,000	45,000	40,000	40,000
Total Cost of Pumps and Pipes	228,500	233,500	307,500	82,500	267,500
Project Cost of Pumps and Pipes (Increase 20%)	274,000	280,000	369,000	99,000	321,000
Project Cost of Treatment	175,000	263,000	355,000	467,000	60,000
Land Cost	48,000	72,000	140,000	189,000	24,000
Total Project Cost	497,000	615,000	864,000	755,000	405,000
Annual Cost	40,100	49,600	69,600	60,842	32,637

TABLE 11-4 — *Continued*

City	Archer	Newberry	High Springs	Alachua	LaCrosse
Annual Debt Service (25% Coverage)	$50,125	$ 62,000	$ 87,000	$ 76,053	$ 40,797
Annual O&M Pumps and Pipes	3,700	4,400	8,775	6,800	4,225
Annual O&M Regional Treatment Plant	13,900	20,800	25,150	33,065	4,240
Total Annual Cost	67,700	87,200	120,900	115,900	49,300

TABLE 11-5

ALTERNATE V—REGIONAL WASTEWATER FACILITIES IN ALACHUA COUNTY

City	Newberry	High Springs	Alachua
1990 Population	2,250	4,450	5,825
Design Flow (gpd)	225,000	445,000	585,000
Design Flow (gpm)	156	309	406
Length of Pipe (ft)	33,000	33,000	44,000
Size of Pipe (in)	6	8	8
Percent of Pipe Used	100	100	100
Cost of Pipe	$214,500	$247,500	$ 330,000
Cost of Pump Station	40,000	45,000	50,000
Total Cost of Pumps and Pipes	254,500	292,500	380,000
Project Cost of Pumps and Pipes (Increase 20%)	305,000	351,000	456,000
Project Cost of Treatment	176,000	348,000	457,000
Land Cost	70,000	140,000	180,000
Total Project Cost	551,000	839,000	1,093,000
Annual Cost	44,403	67,612	88,081

TABLE 11-5 – *Continued*

City	Newberry	High Springs	Alachua
Annual Debt Service (25% Coverage)	$55,500	$84,500	$110,100
Annual O&M Pumps and Pipes	4,575	5,800	9,125
Annual O&M Regional Treatment Plant	15,400	30,470	40,050
Total Annual Cost	75,500	120,800	159,300

TABLE 11-6

ALTERNATE VI–REGIOANL WASTEWATER FACILITIES IN ALACHUA COUNTY

City	High Springs	Alachua	LaCrosse	Part of Northwest Gainesville
1990 Population	4,450	5,825	750	5,904
Design Flow (gpd)	445,000	585,000	75,000	590,000
Design Flow (gpm)	309	406	52	410
Length of Pipe (ft)	35,000 33,000	33,000	35,000 33,000	33,000
Size of Pipe (in)	8 10	10	6 10	8
Percent of Pipe Used	100 40	53	100 7	100
Cost of Pipe	$ 262,500 112,200	$148,665	$227,500 19,635	$ 247,500
Cost of Pump Station	65,000	78,000	44,500	78,000
Total Cost of Pumps and Pipes	439,700	226,665	291,635	325,500
Project Cost of Pumps and Pipes (Increase 20%)	528,000	272,000	350,000	391,000
Project Cost of Treatment	387,000	509,000	66,000	512,000
Land Cost	140,000	180,000	30,000	180,000

TABLE 11-6 — *Continued*

City	High Springs	Alachua	LaCrosse	Part of Northwest Gainesville
Total Project Cost	$1,055,000	$961,000	$386,000	$1,083,000
Annual Cost	85,019	77,444	31,106	87,275
Annual Debt Service (25% Coverage)	106,274	96,805	38,882	109,094
Annual O&M Pumps and Pipes	8,775	20,500	4,225	10,350
Annual O&M Regional Treatment Plant	29,100	38,240	4,900	39,560
Total Annual Cost	144,100	155,500	48,000	159,000

TABLE 11-7

SUMMARY OF SEWER FACILITIES PLAN

City	Alternate					
	I	II	III	IV	V	VI
Waldo	51,100	61,900	74,800	51,100	51,100	51,100
Hawthorne	59,300	84,900	91,100	59,300	59,300	59,300
Micanopy	51,100	58,100	51,100	51,100	51,100	51,100
Archer	56,400	59,500	80,100	67,700	56,400	56,400
Newberry	69,100	67,000	79,700	87,200	75,500	69,100
High Springs	101,200	116,200	145,000	120,900	120,800	144,100
Alachua	125,100	119,000	153,900	115,900	159,300	155,500
LaCrosse	32,800	48,500	53,300	49,300	32,800	47,700

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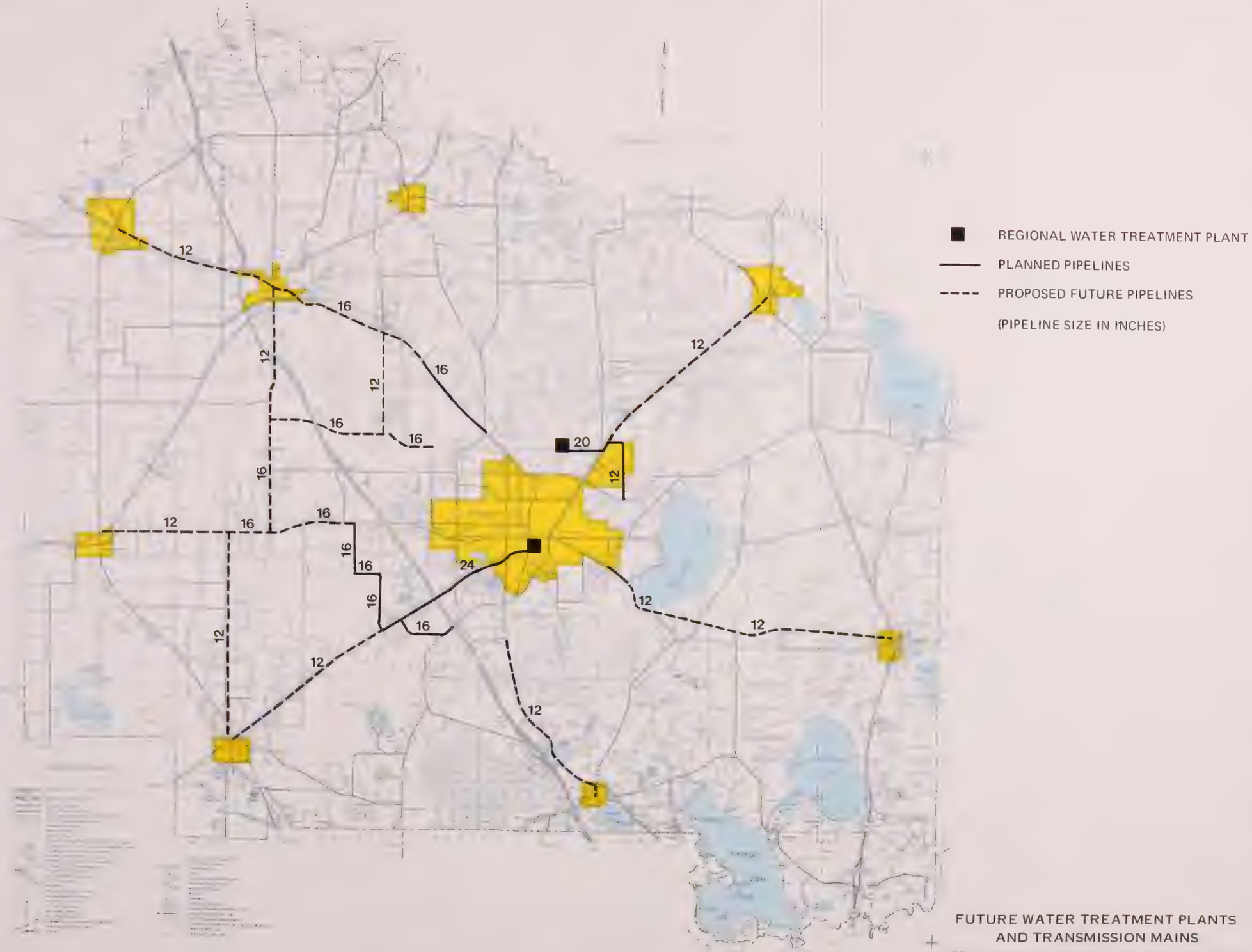
WASTEWATER TREATMENT PLANTS - ALACHUA COUNTY

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS



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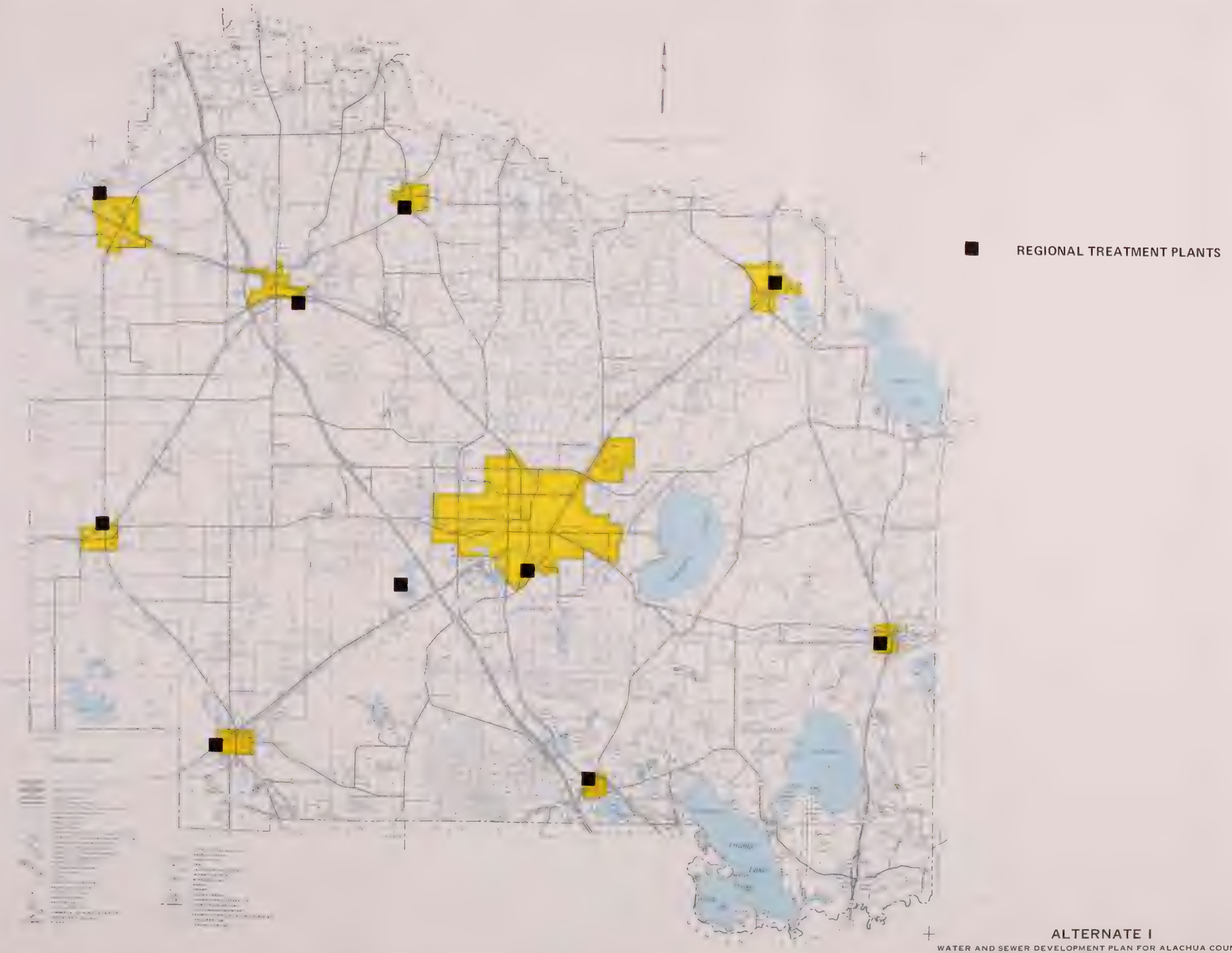
FUTURE WATER TREATMENT PLANTS AND TRANSMISSION MAINS

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS

219-73-50



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ALTERNATE I

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS

219-73-50

PLATE 11-1

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ALTERNATE II

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC
ENGINEERS

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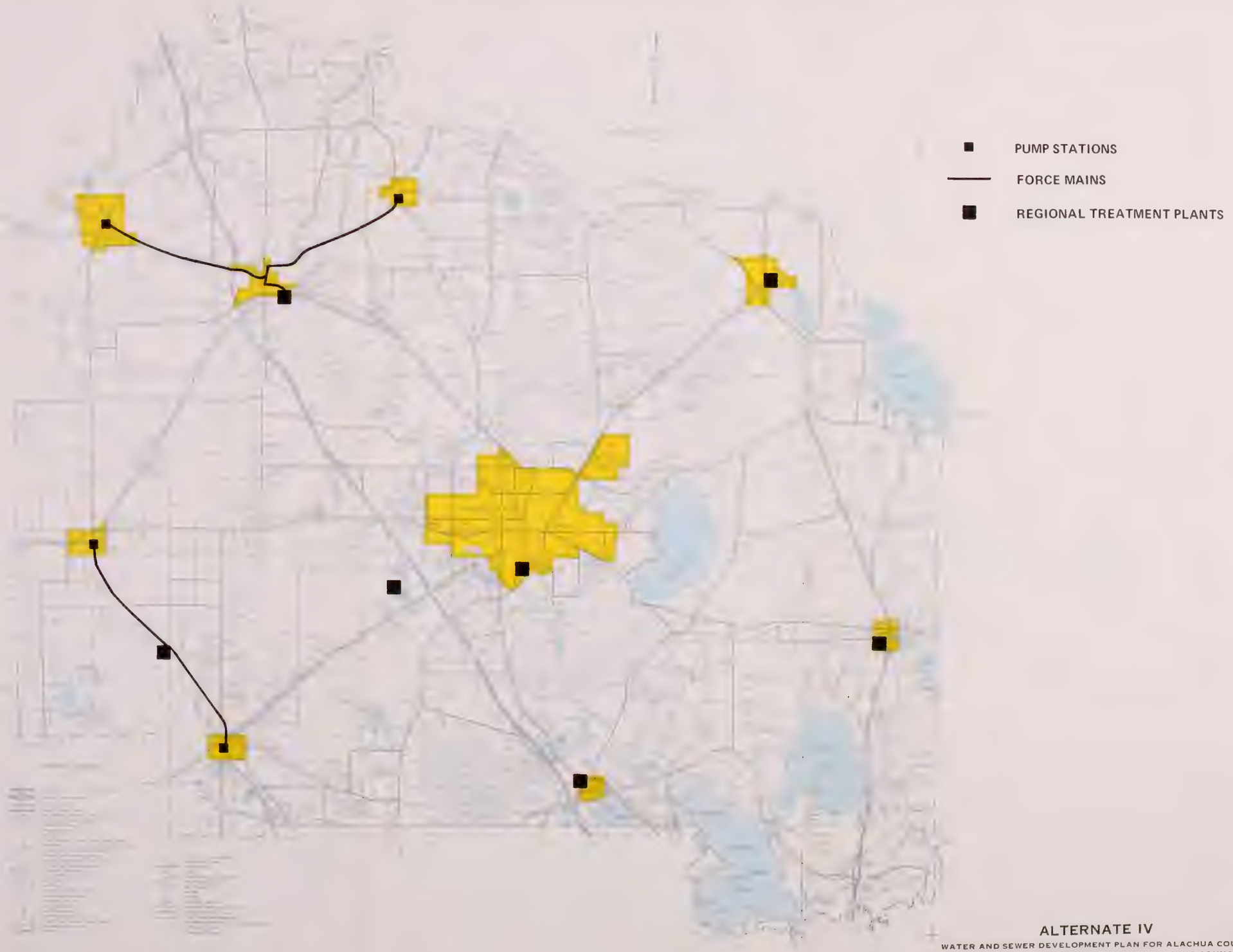
ALTERNATE III

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC.
ENGINEERS



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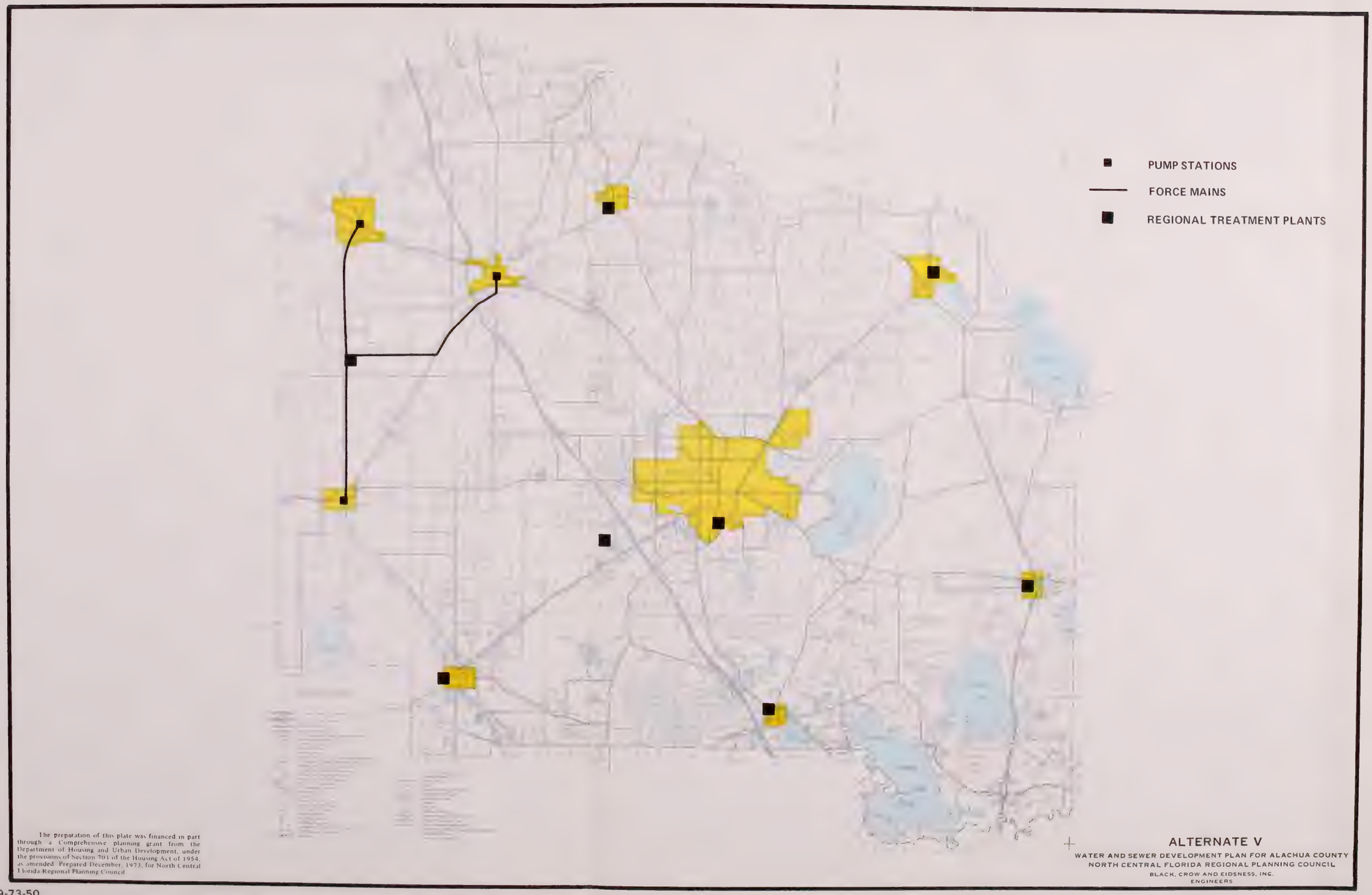
ALTERNATE IV

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
BLACK, CROW AND EIDSNESS, INC
ENGINEERS



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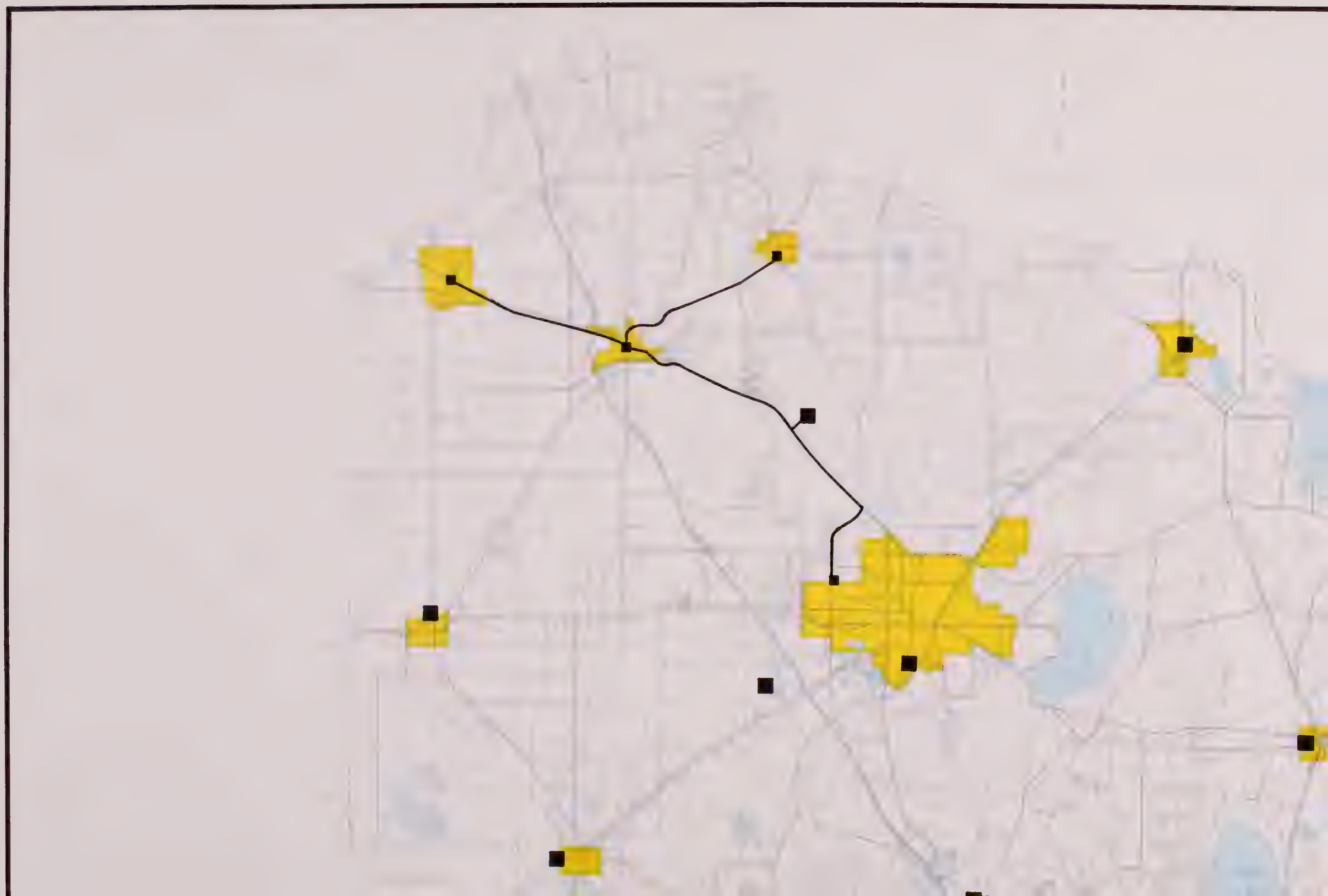
ALTERNATE V

WATER AND SEWER DEVELOPMENT PLAN FOR ALACHUA COUNTY
NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

BLACK, CROW AND EIDSNESS, INC.
ENGINEERS



SECTION 12

PRIORITY IMPROVEMENTS

12.1 WATER

Primary consideration should be given toward the installation of adequate publicwater supply and distribution systems for the communities of LaCrosse and Melrose. A necessary first step these cities should take is to have an engineering report prepared showing required facilities, proposed designs and costs. These cities should also keep in mind that not only is an adequate domestic water supply required but ample fire protection a necessary provision.

With the exception of LaCrosse, all other incorporated communities have public water systems. The needs of each one of these systems have been pointed out in Section 10.0. High priority should be given toward continued upgrading of these systems, especially the distribution systems and installation of proper facilities to offer the best available fire protection.

Priority should also be given to supplying public water to areas where population density is greatly expanding, or where people congregate frequently. These areas are parks and recreational areas, migrant labor camps, and small unincorporated communities.

All the above should be considered high priority water needs, with major concern in the order listed. Priority should also be given toward looking ahead at the overall picture and the long-range needs of area residents. By continually looking ahead, installation of inadequate facilities and duplication can be avoided, thus saving Alachua County residents money and providing them with the best service available. Foremost, toward accomplishing this, is the desirable extension of water services from the various approved and ample water supply centers within the county into the surrounding unincorporated areas. Beyond the time frame and scope of this report, when these growth centers meet, priority should be given to the long-range plans that will insure compatibility of the interconnecting systems in the future.

12.2 SEWER

Initial priority should be given to meet the treatment needs of the city of Waldo. Surface discharge of a septic tank effluent should be eliminated as soon as possible. Coincident with supplying treatment, an extension of the collection system should also be given high priority.

Next in priority would be the preparation of feasibility reports toward providing an entire system for LaCrosse and Micanopy. Presently, these are the only two incorporated areas of the county lacking reports.

Continued efforts should be made toward installation of adequate collection systems in all the incorporated areas of the county with first priorities given on the basis of population and density.

Priority must also be given the areas surrounding the county's lakes. Although economic constraints may play a dominant role in determining when and if facilities will be installed, continued efforts must be exerted to find a way to insure proper collection and treatment of wastes in these areas.

SECTION 13

IMPLEMENTATION PROGRAM

13.1 STATEMENT ON PERIODIC MASTER PLAN REVISIONS AND UPDATING

Alachua County is a growing area with a substantial increase in projected population by 1990. Because this population will need and require proper water and sanitary facilities, this plan should be periodically updated. The present accelerated growth and completion within the next two years of the new water and wastewater facilities in Gainesville, as well as installation of facilities for waste treatment in Alachua and Newberry, indicate that in late 1975 the report should be updated. From that point on, every five years should be sufficient. Updating by addendum should also be considered when events of significant impact to regional water and sewer facilities occur.

This report presently contains much information needed as a base for an areawide water quality management plan. This water quality management plan is not only a requirement of EPA but of vital importance to Alachua County in determining exactly what problem areas exist and where priorities toward water quality management should be laid.

The preparation of a water quality management plan should be high on priorities toward the implementation of the water and sewer facilities program. With such a water quality management plan, the necessity for updating this study can be gaged by determinations of existing water quality problem areas.

13.2 CONCLUSIONS

The following conclusions are arrived at from preparing this report:

1. Alachua County is a growing north central Florida county with a large urban city, Gainesville, located in its geographical center, and surrounded by eight incorporated basically rural communities. Projected to 1990, 90 percent of the county population will be located in the Gainesville urban area.

2. Existing water quality data is scarce and a water quality management plan is needed. Additional water quality information needs to be collected and recommendations made under a management plan so that guidance toward installation of facilities in areas of critical need can be accomplished.

3. Alachua County is underlain by one of the most productive and abundant water supply aquifers in the world. The water needs of Alachua County by 1990 can be easily met by wells which tap this aquifer.

4. Located in the city of Gainesville are two water treatment plants which soften, stabilize, filter, flouridate, and chlorinate water for storage and pumping to residents of the city of Gainesville and the contiguous urban area. These two plants could be used as regional treatment plants centrally located to serve all incorporated municipalities of Alachua County if the areas outside the urban area would desire or need softened treated water. When the new plant, now under construction, is completed (July, 1974) the total combined maximum treatment capability of these plants will be 55 mgd.

5. Located in Gainesville will be two wastewater treatment plants. The first plant is the South Main Street Plant and has a capacity of 9.5 mgd. The second plant is the new Kanapaha Plant (so named due to proximity of Lake Kanapaha). This plant is presently under construction and when complete will have an initial capacity of 7.0 mgd. Both plants have the capacity to serve as regional plants.

6. Assuming all the projected population of the city of Gainesville and urban area were connected to the wastewater collection system, an additional 3 mgd of treatment capacity will be needed before 1990. With growth extending west, the logical location of this plant will be Kanapaha. Sufficient land has been provided for at that site for phased expansions.

7. Only two municipalities presently collect and treat wastes. One is adequate, that of the city of Gainesville. The other is the city of Waldo and is inadequate, does not meet state effluent standards, and is a potential health hazard. Two municipalities have construction drawings underway for their own collection and treatment facilities. They are Alachua and Newberry. Hawthorne, Archer, and High Springs have preliminary engineering reports but have not proceeded with their program due to the high cost of installation of the system. Micanopy and LaCrosse need to have preliminary engineering reports prepared. From the above, we conclude that Hawthorne, Archer, and High Srpings need to seek ways of financing their proposed systems and Micanopy and LaCrosse need to initiate a feasibility study by an engineering firm.

8. Other areas of the county, such as unincorporated communities, park and recreation areas, and areas of population concentration should endeavor to have a feasibility report prepared for the provision of water and sewer facilities if both do not exist. The best initiative toward this may be action by the Regional Utilities Board, which should include, as part of their continuing program planning efforts, consideration of means whereby these areas might best be served by individual or regional systems.

Encouragement should be extended by the Regional Utilities Board to representatives of all these unincorporated communities to utilize the staff and resources of the Regional Utilities to enhance the quality and effectiveness of their systems.

13.3 RECOMMENDATIONS

We recommend that all water supplies and sanitary wastewater systems in the county will be owned, administered, and managed by either a county, special district, or municipal governing body. This is not intended to constitute a brief for public ownership of water and wastewater utilities. However, in Alachua County such public ownership appears to be the only alternative to preclude an expansion of a hodge-podge of small systems which cannot provide safe and dependable service. The determination of the entity, whose ultimate responsibility these facilities will be, is not the intent of this report. However, the establishment and accomplishments to date of the Regional Utilities Board suggests that this body is the base upon which to build an effective regional utilities management organization.

We also recommend that this report be initially updated in 1975 to accurately reflect the installed facilities at that time. After 1975, an update every five years should be adequate. The Regional Planning Council annually conducts data gathering as required, in order to continue maintaining HUD water and sewer planning certification. Adding this information to the report every five years should be sufficient to effectively evaluate changing conditions through the updating periods.

Listed below and summarizing this report is a recapitulation of the recommendations listed from Sections 10 and 11.

13.4 SUMMARY OF RECOMMENDED WATER DEVELOPMENT PLAN

1. The city of Waldo should install, as soon as possible, a new well and water supply pump for standby purposes. The installation of this pump, as well as appropriate distribution system extensions, should be sufficient to meet Waldo's needs to the year 1990. Were the city

to determine that softened water would be desirable, the city should direct their consulting engineers to again analyze the possibility of tying into the regional treatment plant versus construction of its own individual water softening plant. At this time, it does not appear economical to tie into the regional water treatment facilities located in Gainesville.

2. The present facilities for the city of Hawthorne appear to be adequate to meet projected needs to the year 1990. It is recommended, however, that these facilities be maintained and the older facilities be replaced or repaired. A vigilant maintenance and water distribution extensions program should be ongoing with the city to insure the best and safest water utilities for the city and residents of Hawthorne.

3. The facilities of the Micanopy system appear to be in good condition and should be adequate to the year 1990. However, at present, no standby facilities are available for supply and distribution. It is therefore recommended that the city explore the possibility of installing a new well. If softened water is deemed desirable by the city of Micanopy, it appears more economical for this water to be pumped from the regional water treatment plant located in Gainesville. This plan is shown on Plate 10-1.

4. The existing water utility for the city of Archer should meet anticipated needs by the year 1990. However, Archer also has no standby facilities. It is recommended that a new well be constructed and placed in operation as soon as possible. If the city of Archer desires softened water, it appears more economical to supply from the regional system in Gainesville than for Archer to construct its own softening plant. A 12-inch water main from the extent of the regional water system in Gainesville to Archer, along the Archer Road, should meet these needs until 1990.

5. The existing water facilities for the city of Newberry appear to be adequate to meet the needs to the year 1990. However, these facilities are in need of repair and perhaps replacement and updating. It is recommended that Newberry pursue a vigorous replacement and renewal program, as well as continue adequate extensions to its distribution system. If the city of Newberry were to request softened water, it would be more economically supplied from the regional treatment facilities in Gainesville than construction of a softening plant in Newberry.

6. The water treatment plant facilities in High Springs will be adequate until 1977. One immediate problem facing High Springs is that the present water quality of the existing wells is poor and the treatment plant is in need of better maintenance and repairs. With capacity soon to be exceeded, three alternates exist for High Springs. The first would be to obtain treated water from the regional water treatment plant. The second would be to install a new plant expansion to the existing plant and update, repair, and modernize the existing plant. The third would be to consider installation of a new well field and find water of a better quality in lieu of expanding the existing treatment facilities. Because these three alternates exist, we recommend that the city's consulting engineers prepare a report for presentation of these alternates to the city of High Springs. The recommendation from that report, upon approval of the Regional Planning Council, could be added to this report by addendum.

7. Present facilities located in the city of Alachua appear to be adequate to the year 1980. At that time a new well will be needed. Prior to installation of this well Alachua should determine if softened water is desirable. If so, it would be more economical for this water to be supplied from the regional water treatment plant in Gainesville than for Alachua to construct their own treatment facility.

8. Presently LaCrosse has no public water supply. It is recommended that LaCrosse obtain the services of a consulting engineer and have prepared a preliminary engineering report for a public water system in LaCrosse. If LaCrosse desires softened water, it appears that this water could best be supplied from the regional system located in Gainesville.

9. The city of Gainesville's water treatment plants should be adequate to meet the needs to the year 1990. The installation of the new 30 mgd water treatment plant, located north of town, in addition to the existing water treatment plant, will be capable of supplying a maximum of 55-mgd of treated water. When the new 30-mgd treatment plant goes into service, the existing 15-mgd treatment plant could be repaired and maintained in a state of readiness. It is anticipated that this plant will have to be used to supply treated water before the year 1990. Shown on the solid lines on Plate 10-1 are major water distribution mains which should be installed as soon as possible. The 16-inch line on U.S. 441 from SR 121 to the new Deer Haven Power Plant has already been installed. Before actual construction drawings are prepared for the installation of these

facilities, it is recommended that an update of the water distribution section of the Gainesville Ten Year Master Plan, submitted by the city's consultants in 1965, be prepared. This report should contain a complete Hardy-Cross analysis of the entire distribution system so that areas of low pressure could be remedied by recommended improvements and that future facilities could be sized accordingly.

10. As the distribution system extends out from the Gainesville urban area, many unincorporated areas of Alachua County can be supplied with treated water from these water main extensions. In other areas where these facilities will not become available, proper disinfection of the water and maintenance of the facilities should be required. It is hoped that by the extension of these transmission and distribution systems that all residents of Alachua County will have available an adequate treated and softened water supply.

13.5 SUMMARY OF RECOMMENDED SEWER DEVELOPMENT PLAN

1. The cities of Waldo and Hawthorne need to have their preliminary engineering reports updated and consideration given to financing these systems. At this time, and within the 1990 planning period, it appears more economical for individual treatment facilities to be located in these communities than to pump to a regional plant.

2. Micanopy and LaCrosse need to have preliminary engineering reports prepared.

3. For the communities of Archer, Newberry, High Springs, and Alachua, it appears somewhat marginal in annual cost between the alternates of individual treatment versus pumping to the Kanapaha Regional Plant. Consideration toward pumping to the regional plant should be given prior to construction of individual plants.

4. The smaller, rural, unincorporated communities should give consideration to a preliminary engineering report to determine the feasibility of provisions of sanitary facilities and water facilities. The community of Melrose should give this serious consideration due to population density and proximity to Santa Fe Lake.

5. Since Newberry and Alachua have construction drawings underway for their systems, another consideration which might be given would be the installation of interim packaged plants that are portable.

These portable plants could then be easily moved and reinstalled in other expanding areas of need when the existing user diverted flow to the Gainesville regional plants.

6. We recommend that prior to construction, future wastewater treatment facilities should be reviewed by the Regional Planning Council and the Regional Utilities Board.

In this report, with flows projected to 1990, a strict interpretation of the cost analysis indicates that the installation of centrally located (Gainesville) facilities is not cost effective when compared to decentralized or individual municipal systems. However, for Archer, Newberry, High Springs, and Alachua the decision on pumping to Gainesville versus constructing their own facilities appears marginal. Before a decision on which course to pursue, other concerns, such as political inclination and Regional Utilities operational preferences, should be given consideration. The recommendations of this report consider only the engineering economics and do not include these extraneous concerns.

PART III

APPENDIXES

APPENDIX A

C - O - P - Y

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
JACKSONVILLE AREA OFFICE
PENINSULAR PLAZA
661 RIVERSIDE AVENUE
JACKSONVILLE, FLORIDA 32204

IN REPLY REFER TO: 4.6 PPC

December 27, 1972

Mr. Richard D. Tarbox, Executive Director
North Central Florida Regional Planning Council
5 S. W. Second Place
Gainesville, Florida 32601

Dear Mr. Tarbox:

As described in Circular MPD 6415.1A fulfillment of the planning requirements of various HUD grant and loan programs is based on three certifications by the Department of Housing and Urban Development. For a given area, HUD will certify an area as to:

1. The institutional arrangement for planning in a given area (Area-Organization);

2. The status of comprehensive planning; and

3. The status of functional planning and programming.

We are pleased to inform you that the Alachua County area has been certified for the periods indicated:

1. There exists an adequate areawide planning organization for the area.
   Period: January 1, 1973 to January 1, 1974

2. The Areawide Planning Organization is carrying out adequate long-range comprehensive planning for the area.
   Period: January 1, 1973 to January 1, 1974

3. There exists consistent and coordinated with comprehensive planning an adequate long-range areawide Water/Sewer plan and an adequate short-range Water/Sewer program.
   Period: January 1, 1973 to January 1, 1974

4. There exists consistent and coordinated with comprehensive planning an adequate long-range areawide open space plan and an adequate short-range open space program.
Period: January 1, 1973 to January 1, 1974

However, it should be pointed out at this time that HUD will expect all Water/Sewer and open space projects initiated under this Certification to be in conformance with the draft elements referenced in the certification application when formally adopted.

We are confident that your progress and interest in the planning process will benefit the Alachua County area in providing a means of coordinating resources and discovering economical solutions in meeting the jurisdiction's present and future public improvement needs. We offer our best wishes to you and other public officials in the continued development of program activities designed to refine and implement the planning effort.

Sincerely,

s/

Forrest W. Howell
Area Director

APPENDIX B

ORDINANCE NO. 1883

0-73-32

AN ORDINANCE PERTAINING TO FLOOD CONTROL; AMENDING THE GAINESVILLE CODE OF ORDINANCES BY ADDING A NEW CHAPTER 30, RELATING TO FLOOD PREVENTION AND FLOOD CONTROL BY PROHIBITING CONSTRUCTION, RECONSTRUCTION, DEVELOPMENT, DREDGING OR FILLING IN ANY AREA DESIGNATED AS EITHER A FLOOD CHANNEL DISTRICT, A FLOOD PLAIN DISTRICT, A DRAINAGE BASIN DISTRICT, OR A FLOOD WATER DETENTION AND RETENTION AREA WITHOUT A PERMIT THEREFORE; DEFINING SUCH DISTRICTS AND AREAS AND PRESCRIBING REGULATIONS FOR EACH; ADOPTING FLOOD CONTROL MAPS; PROVIDING FOR CONDITIONS AND PROCEDURES FOR ISSUANCE OF PERMITS; PROVIDING FOR APPEALS TO THE BOARD OF ADJUSTMENT; AND PROVIDING PENALTIES.

BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF GAINESVILLE:

Section 1. The Gainesville Code of Ordinances is hereby amended by adding a new Chapter 30, the sections of which will be appropriately numbered which shall read as follows:

Section 1. Purpose.

Because certain areas of the city are subject to flood hazard, the Gainesville flood control ordinance is hereby enacted in order to: (1) prevent personal injury and loss of life, (2) prevent the installation of structures which limit the channel capacity and increase flood heights, (3) prevent excessive property damage, (4) protect the public health, (5) reduce public expenditures for emergency operations, evacuations, and restorations, (6) discourage losses to uninformed and unwary land and property buyers, (7) prevent damage to industries, transportation and utility systems, and (8) prevent further unwise expansion and development in unprotected flood plains, thus reducing future expenditures for expensive protective measures. These regulations are made with reasonable regard to existing conditions, the character of structures and other developments existing in each district, the most desirable use for which the land in each district may be adapted and the protection of property values throughout the zoning districts.

Section 2. Flood Control Planning Districts and Areas.

(a) Flood Channel District: That geographic area inundated as a result of the rainfall which occurs once in ten (10) years on the average based upon conditions existent at the time of passage of this ordinance.

(b) Flood Plain District: That geographic area adjacent to the flood channel district which is inundated as a result of the rainfall which occurs once in one hundred (100) years on the average based upon conditions existent at the time of passage of this ordinance.

(c) Drainage Basin District: That geographic area that drains only a designated stream, lake, pond, sink or swamp or other designated drainage sink, excluding flood plain district areas. All of the territory within the City Limits of the City of Gainesville is within a drainage basin, excluding flood plain district areas. (Example: the Hogtown drainage basin comprises all the geographic area that ultimately drains into Hogtown Sink).

(d) Flood Water Detention and Retention Areas: Areas found in any flood control planning district that because of their natural formation are or can readily be made to be areas of significant potential for use as places of detention or retention of flood waters as a part of a comprehensive flood control plan. Flood detention and retention areas are not limited to sites abutting or near to flood channels.

Section 3. Master Flood Control Planning Maps.

(a) Lands to Which Ordinance Applies: This ordinance shall apply to all lands within the jurisdiction of the City of Gainesville shown on the Master Flood Control Planning Maps as being located within the boundaries of the flood channel district, flood plain district, drainage basin district, and flood water detention and retention area.

(b) Establishment of Master Flood Control Planning Maps: Delineations of the boundaries of flood control planning of districts and areas shall be made for each drainage basin, each flood plain, each flood channel, and each retention and detention area on a master flood control planning map approved by the City Commission. The master flood control planning map shall be prepared and maintained by the City Manager with the advice and consultation of the City Engineer, the North Central Florida Regional Planning Council, representatives of the County Commission and other planning and engineering specialists as

determined by the City Commission. The maps shall be attached hereto and are adopted by reference and declared to be part of this ordinance.

(c) Use: All land use decisions made with respect to this ordinance shall be made with reference to the master flood control planning maps. The boundaries of the zoning district shall be determined by scaling distances on the maps.

(d) Review and Modification: The City Manager shall review the master flood control planning map at not less than three year intervals and recommend changes to the City Commission as are indicated by the current engineering and planning information. Intermediate re-evaluations may be directed by the City Commission.

Section 4. Prohibited Uses.

(a) Flood Channel Districts: Hereafter it shall be unlawful for any person, natural, corporate, governmental or otherwise, to erect, remodel, or alter any permanent structure or other development or to dredge or fill in any flood channel without a permit issued by the City Manager. Filling with junk, trash, garbage, or offal shall not be permitted. No permanent structures or fills shall be allowed except structures and fills designed for flood prevention and control, streets, bridges, and utility lines. No dredging shall be allowed except to enhance the flood control capacity of the entire channel. Storage of materials that are buoyant, flammable, explosive, toxic, or otherwise potentially harmful to human, animal, or plant life and health, such as chemicals and poisons, is prohibited. Where flood channel is stagnant water, i.e., an area of the flood channel where water leaves only through percolation and/or evapo-transpiration, the restrictions of the flood plain district shall apply.

(b) Flood Plain Districts: Hereafter it shall be unlawful for any person, natural, corporate, governmental or otherwise, to erect, remodel, or alter any permanent structure or other development or to dredge or fill in any flood plain district without a permit issued by the City Manager. No such permit shall be issued if the proposed activity shall reduce the capacity of the flood plain district to which the application applies as it exists at the date of the application for such permit. For the purposes of this subsection, any

development which effectively raises the average ground or improvement surface shall be taken to reduce the flood plain district portion of the property. In no event shall any institution or place of assembly for the mentally or physically ill, the young or aged, such as a school, nor any place of incarceration, be permitted.

(c) Drainage Basin District: It is anticipated that this sub-section will be prepared as soon as technical information is available.

(d) Flood Water Detention and Retention Areas: Hereafter it shall be unlawful for any person, natural, corporate, governmental or otherwise, to erect, remodel, or alter any permanent structure or other development or dredge or fill in any flood water detention or retention area without a permit issued by the City Manager. No such permit shall be issued if the proposed activity would create a flooding hazard to the structure or other development so created or if the retention or detention capacity of the affected area were reduced to less than its original capacity when first officially designated as a detention or retention area, or unless equivalent detention or retention capacity to the total of that being eliminated is otherwise provided.

(e) General: Notwithstanding other provisions of this ordinance, no permit to excavate or fill, build in, obstruct or alter any flood channel district or any flood plain district shall be issued, if to do so would create:

(1) Harmful soil erosion from the land and shoaling in a water course. Sediment migration from the developed area should at no time prior, during, or after construction exceed the rate and character which is natural to any area. Sediment migration shall be measured by turbidity measurements in Jackson's units.

(2) Stagnant areas of water adjacent to or on nearby property unless they are specifically designed for flood or sedimentation control.

(3) An irreversible harmful impact on the existing flora and fauna in a flood channel.

(4) Otherwise uncontrolled danger to life and property as a result of increased flood heights or velocities caused by proposed uses.

(5) Otherwise uncontrolled danger to life or property caused by lack of access to the property in times of flood by ordinary or emergency vehicles.

(6) Any condition incompatible with the flood control and protection purposes of this ordinance.

Section 5. Permitted Uses.

(a) Flood Channel Districts: Within the limitations of Section 4(a), Section 4(e) and other applicable zoning regulations, the following uses are permitted:

(1) Agricultural uses such as general farming, pasture, grazing, outdoor plant nurseries, horticulture, viticulture, forestry, and wild crop harvesting.

(2) Private and public recreational uses such as golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, launching areas for nonpower boats, swimming areas, parks, wild life and nature preserves, fishing areas, hiking, bicycling and horseback riding trails.

(3) Uses such as lawns, gardens, parking areas and play areas.

(4) Temporary structures and fills for the purpose of constructing legal developments in a non-flood channel district. No temporary structure or fill may be permitted for more time than is reasonably required for completion of the legal development and none may be permitted if a serious temporary flooding hazard would be created. Temporary structures or fills may not be permitted unless firmly anchored against flotation or erosion in the event of unexpected flooding. All expenses of removing the temporary structure and fills and restoring the flood channel to its original condition shall be borne by the permitee.

(5) Governmental and public utility projects such as flood control filling and dredging, streets, bridges, and utility transmission lines and pipes under the following restrictions:

(A) Any fill or dredge must be shown to have a beneficial flood control purpose or otherwise protect the public welfare and any fill shall be protected against erosion by rip rap, vegetation, or bulkheading, or other acceptable means.

(B) Structures shall be constructed so as to minimize obstruction to the flow of the channel, unless flow control is intended. Structures shall be firmly anchored to prevent flotation which may result in damage to other property, restriction of bridge opening and other narrow sections of the stream or river.

(b) Flood Plain Districts: Within the limitations of Sections 4(b) and 4(c) and other applicable zoning regulations, the following uses are permitted:

(1) Uses permitted in Section 5(a).

(2) Launching areas for power boats, marinas, boat rentals, docks, piers and wharves.

(3) Structures for uses permitted by the existing zoning ordinance may be constructed on stilts, piles, or interrupted masonry foundations or conventional foundations, if retention is provided for the volume displaced at the same elevation of centroid of volume, so that the first floor and basement floor are not less than the level of the 100-year flood at each point. Utility services such as sewer, water and electricity must be installed to function properly in a 100-year flood.

(4) Storage of materials shall be allowed in structures satisfying the requirements of subsection (2) above. Flammable, poisonous, toxic, explosive and other materials potentially harmful to human, animal or plant life and health must be adequately sealed and anchored to prevent rupture, collapse or flotation caused by the presence of flood waters or floating debris.

(5) Uses such as parking lots and loading areas.

(c) Drainage Basin Districts and Flood Water Detention and Retention Areas: Any use within the limitations of Sections 4(c), 4(d), and 4(e) and other applicable zoning regulations.

Section 6. Procedure.

(a) Permitting Agency: All applications for permits shall be made in duplicate to the City Manager for processing as herein specified.

(b) Applications: Applications shall be made on forms specified by the City Manager and shall provide at least the following information:

(1) The applicant's name and address and the owner or owners of the property involved.

(2) A map showing the property containing the area for which the permit is being sought, including an accurate designation of flood control planning districts affected by this application and the exact boundaries of the proposed development.

(3) A description of the proposed activity in sufficient detail to determine the propriety of the activity under Section 3.

(c) City Manager's Action: The City Manager shall examine all engineering and planning information supplied by the applicant and by his staff to determine conformity with the above requirements. Permits shall be issued for conforming applications. Where in the opinion of the City Manager additional engineering or other studies or information are needed to determine the effects of a proposed use on flooding or any criterion contained in this ordinance, the City Manager shall require the applicant to have the additional studies and information prepared by qualified engineers or other appropriate qualified professionals and submitted prior to making a final decision on the application.

Section 7. Nonconforming Uses.

Continuation Conditions: Any structure, development or use existing at the time of enactment or subsequent amendment of this ordinance, but not in conformity with its provisions may be continued except it may not be:

(1) Changed to another nonconforming use; or

(2) Extended except in conformity with this ordinance, or

(3) Rebuilt or repaired after damage exceeding 70 percent of the fair market value of the structure or development immediately prior to damage.

Section 8. Appeals-Board of Adjustment.

(a) Jurisdiction: The Board of Adjustment created by Section 2-49 of the Gainesville Code of Ordinances shall have jurisdiction to hear any appeal by any person aggrieved within thirty (30) days from the date of the entry of any decision by an administrative officer pertaining to the provisions of this ordinance under the procedure and provisions of Sections 2-49 through 2-59 where applicable and particularly Section 2-54 of the Gainesville Code of Ordinances. The jurisdiction of the Board of Adjustment shall be limited to determining whether there is error in any order, requirement, decision or determination made by an administrative official of the City in the enforcement or interpretation of the provisions of this ordinance.

(b) No Variance or Special Exception Permitted: There are no special exceptions provided for in this ordinance and no variance shall be granted to any of the provisions of this ordinance.

(c) Resort to Courts: Any person aggrieved by a decision by the Board of Adjustment may appeal to a court of competent jurisdiction within thirty (30) days after a decision of said Board by filing appropriate proceedings in such court and at the same time filing a notice of such appeal with the secretary of the Board.

(d) Stay of Proceedings: An appeal shall stay all proceedings in furtherance of the action appealed from unless the officer from whose action the appeal is taken shall certify to the Board after the appeal has been filed that by reason of facts stated in the certificate, a stay, in his opinion, would cause imminent peril to life or property, in which case there shall be no stay except by the order of the Board of Adjustment or by a court of competent jurisdiction following notice to the officer from whose action the appeal is taken and due cause shown.

Section 2. Penalties. It shall be unlawful for any person to violate any of the provisions of this ordinance, and upon conviction for any such violation, such person shall be punished as provided in Section 1-8 of the Gainesville Code of Ordinances. Each day such violation occurs or continues shall constitute a separate offense.

Section 3. If any provision of this ordinance is declared invalid by a court of competent jurisdiction, such declaration shall not affect the remaining portions of this ordinance.

Section 4. Ordinance No. 1849 and Ordinance No. 1864, heretofore adopted by the City Commission, and all ordinances in conflict herewith are to the extent of such conflict hereby repealed.

DATED this 30th day of April, A.D., 1973.

s/ _____

MAYOR-COMMISSIONER

ATTEST:

s/ _____

CLERK OF THE COMMISSION

ORDINANCE NO. 1894
0-73-43

AN ORDINANCE RELATING TO FLOOD CONTROL; AMENDING SECTIONS 4(c) AND 4(e) OF ORDINANCE NO. 1883, PERTAINING TO REGULATIONS FOR DRAINAGE BASIN DISTRICT; REQUIRING A HYDROLOGIC STUDY DEMONSTRATING NO INCREASE IN RATE OF DISCHARGE OF STORM WATER RUN-OFF FOR DEVELOPMENTS REQUIRING SITE PLAN APPROVAL OR PLATTING; PROHIBITING ISSUANCE OF PERMITS UNDER STATED CONDITIONS IN DRAINAGE BASIN DISTRICTS; PROVIDING EFFECTIVE DATES; AND PROVIDING PENALTIES.

BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF GAINESVILLE:

Section 1. Section 4(c) of Ordinance No. 1883 of the Gainesville Code of Ordinances is hereby amended to read as follows:

Section 4(c). Drainage Basin District.

(1) This sub-section applies to property subject to site plan approval or platting. Temporarily, until the drainage studies providing data for an area wide approach to water management are completed, and a substitute for this section shall have been adopted, the person seeking site plan approval or platting shall provide a hydrologic study performed by a qualified engineer demonstrating that any work on the site will not increase the rate of discharge of storm water run-off to downstream property beyond what would occur before the alteration. In the event that such a study shows the rate would increase, the developer's plans must show what provisions are to be made to contain this increase on the developed land or that the developer will participate in the proportionate costs of necessitated means of controlling the rate of discharge of storm water run-off.

(2) Sub-section 4(c)(1) shall not apply to the exceptional cases where hydrological calculations show the flood hydrographic peak would be raised at any downstream point by adhering to these provisions.

Section 2. Section 4(e) of Ordinance No. 1883 of the Gainesville Code of Ordinances is hereby amended to read as follows:

Section 4(e) General. Notwithstanding other provisions of this ordinance, no permit to excavate or fill, build in, obstruct or alter any flood channel district or any

flood plain district or any drainage basin district shall be issued, if to do so would create:

(1) Harmful soil erosion from the land and shoaling in a water course. Sediment migration from the developed area should at no time prior, during, or after construction exceed the rate and character which is natural to any area. Sediment migration shall be measured by turbidity measurements in Jackson's units.

(2) Stagnant areas of water adjacent to or on nearby property unless they are specifically designed for flood or sedimentation control.

(3) An irreversible harmful impact on the existing flora and fauna in a flood channel.

(4) Otherwise uncontrolled danger to life and property as a result of increased flood heights or velocities caused by proposed uses.

(5) Otherwise uncontrolled danger to life or property caused by lack of access to the property in times of flood by ordinary or emergency vehicles.

(6) Any condition incompatible with the flood control and protection purposes of this ordinance.

Section 3. Penalties. It shall be unlawful for any person to violate any of the provisions of this ordinance, and upon conviction for any such violation, such person shall be punished as provided in Section 1-8 of the Gainesville Code of Ordinances. Each day such violation occurs or continues shall constitute a separate offense.

Section 4. All ordinances, or parts of ordinances, in conflict herewith are to the extent of such conflict hereby repealed.

Section 5. Effective Dates. This ordinance shall become effective on the 25th day of July, 1973, and shall be of no further force and effect after June 30, 1974.

PASSED this 25th day of June, A.D., 1973.

s/ James G. Richardson
MAYOR-COMMISSIONER

ATTEST:

s/ D. E. Hope
CLERK OF THE COMMISSION

APPENDIX C

RESOLUTION NO. 1

PASSED June 9, 1972

RESOLUTION APPROVING INTERLOCAL AGREEMENT
AND AUTHORIZING ITS EXECUTION.

WHEREAS, the City of Gainesville and Alachua County deem it to be in the best interest of the health, welfare and safety of the citizens of the City and the County to enter into an Interlocal Agreement providing for the creation of the Gainesville-Alachua County Regional Water and Sewer Utilities Board charged with the responsibility of making policy in relation to the furnishing of water and sanitary sewer services in the City of Gainesville and in the unincorporated areas of Alachua County in the areas where needed as evidenced by such agreement, a copy of which is attached to and hereby made a part hereof.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF GAINESVILLE that we do hereby ratify and approve said Interlocal Agreement and do hereby authorize its execution by the Mayor-Commissioner and Clerk of the Commission.

PASSED this 9th day of June, A.D., 1972.

s/ Richard T. Jones
MAYOR-COMMISSIONER

ATTEST:

s/ D. E. Hope
CLERK OF THE COMMISSION

RESOLUTION NO. 2

PASSED June 9, 1972

A RESOLUTION IMPLEMENTING THE SERVICE NEEDS FOR THE TREATMENT AND DISPOSAL OF WASTE WATERS IN THE URBAN AREA OF GAINESVILLE.

WHEREAS, in order to provide for the public health, welfare and safety of the citizens of the City, and of the urban area surrounding the City, a study and plan has been developed by the Florida Department of Pollution Control providing for Water Quality Management for the entire urban area surrounding the City of Gainesville, a copy of which is on file in the office of the Clerk of the Commission, and

WHEREAS, in order to implement said Water Quality Management Plan the immediate construction of additional waste water treatment and disposal facilities is needed in the area west of the present city limits of the City of Gainesville, and a Federal Grant to assist in the financing of such facilities has been sought through the Environmental Protection Agency of the Department of Interior of the Government of the United States, under Public Law 660, and

WHEREAS, in order to qualify for such a Federal Grant a commitment must be made that such facilities will be operated on a Regional basis by a single administrative body without regard to political or governmental boundaries, and the City of Gainesville desires to make such commitment and to operate such facilities on a Regional basis under policies to be set by the Gainesville-Alachua County Regional Water and Sewer Utilities Board, which has been created by Interlocal Agreement entered into by the City of Gainesville and Alachua County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF GAINESVILLE as follows:

1. The City of Gainesville does hereby recognize the requirements of Regionalization in Water Quality Management as included in the guidelines of the Environmental Protection Agency of the Department of Interior of the Government of the United States.

2. Consistent with the guidelines of Water Quality Management as developed by the Environmental Protection Agency, if the City is awarded the Public Law 660 Federal

Grant, and can therefore complete the construction of planned waste water treatment and disposal facilities as included in the Water Quality Management Plan for the urban area of Gainesville herein referred to, the City does hereby agree to operate such facilities as a Regional facility and the City will accept, treat and dispose of all waste waters in the entire urban area of Gainesville upon such reasonable terms and conditions as may be from time to time agreed upon by the City and Alachua County.

3. In the operation of such facilities the City does hereby agree to comply with and abide by all policies of the Gainesville-Alachua County Regional Water and Sewer Utilities Board created by Interlocal Agreement entered into between the City of Gainesville and Alachua County.

PASSED this 9th day of June, A.D., 1972.

s/ Richard T. Jones
MAYOR-COMMISSIONER

ATTEST:

s/ D. E. Hope
CLERK OF THE COMMISSION

INTERLOCAL AGREEMENT

THIS INTERLOCAL AGREEMENT, made and entered into this 9th day of June, 1972, by and between the City of Gainesville, a municipal corporation, (hereinafter called "City"), and Alachua County, a political subdivision of the State of Florida (hereinafter called, "County"):

WITNESSETH:

WHEREAS, the City and County are authorized by Florida Statutes 163.01 to enter into interlocal agreements to cooperatively utilize the most efficient use of their powers on a basis of mutual advantage and to provide services and facilities in accord best with geographic, economic, population and other factors influencing the needs and development of the local community, and

WHEREAS, a public agency of this State is authorized to exercise jointly with any other public agency of the State or of the United States, authority which such agencies share in common and which each might exercise separately, and

WHEREAS, in order to provide for the public health, welfare and safety of the citizens of the City and the County a regional approach is necessary to the furnishing of water and sanitary sewer services without regard to political or governmental boundaries, although both the City and the County are now separately engaged in the furnishing of these services, and in some cases in competition with each other, and

WHEREAS, it is in the best interest of the citizens of the City and the County that a single entity make the policies necessary in connection with the providing and the furnishing of water and sanitary sewer services in the areas needing such services in the City and in the unincorporated areas of the County, and

WHEREAS, since such an entity will have broad powers and responsibility it should be composed of the elected City Commissioners and the elected County Commissioners.

NOW, THEREFORE, for and in consideration of the mutual benefits to flow to each other, The City of Gainesville, and Alachua County, and to the citizens residing in both the City and County, and in consideration of the mutual covenants, promises and agreements herein contained, the City and the County hereby agree with each other as follows:

1. Purpose of Agreement. The purpose of this Agreement is to create a legal entity composed of the five (5) members of the City Commission of the City of Gainesville and

the five (5) members of the Board of County Commissioners of Alachua County, Florida, to be known as the Gainesville-Alachua County Regional Water and Sewer Utilities Board (hereinafter referred to as "Board"). The Board is charged with the responsibility of providing water and sanitary sewer services on a regional basis where needed in the City and throughout the unincorporated areas of the County by the use of existing facilities and any expansion or extension thereof, as well as all new facilities that may later come into existence in the City and in the unincorporated areas of the County. Such Board shall make all policies for the administration, operation, maintenance, extension, enlargement, development, replacement and repair of the systems in the City and in the unincorporated areas of the County furnishing water and sanitary sewer services. To accomplish these purposes the City and County respectively and mutually agree with each other to comply with and abide by all such policies as shall be set and determined by such Board.

2. Duration. The Board shall continue in existence until it is dissolved by a majority action of both the City Commission of the City of Gainesville and the Board of County Commissioners of Alachua County, or by governmental restructuring or reorganization when ratified by the qualified electors of Alachua County.

3. Powers and Procedures. The Board shall meet immediately and select a Chairman and such additional officers, agents and employees as the Board shall from time to time determine, who shall continue to hold such position until their successor is duly selected. The Board shall meet at least once each month or more often when necessary upon call of the Chairman to transact the business of the Board. The Board shall have the power and authority to accept funds appropriated to it by any governmental body or from whatever source. It may apply for and receive grants and donations of all kinds, and it may expend all such funds for any lawful purpose consistent with the general purposes of said Board. The concurring vote of six (6) members of the Board shall be necessary to decide any question. The Board shall adopt by-laws, rules and regulations to govern its actions and procedures. In the performance of its duties and functions, the Board shall have all powers and authority of either or both the City of Gainesville and Alachua County in connection with the furnishing of water and sanitary sewer services. The Board shall have the authority, independently or by or with the assistance of either of the participating parties hereto, to enforce all rules, regulations and policies adopted under the authority of this agreement and may resort to any necessary legal process for this

purpose. The Board shall have such additional powers as are by resolution or agreement lawfully delegated to it by either or both the City of Gainesville or Alachua County. It is not the purpose of this agreement to transfer ownership of any existing water or sanitary sewer facilities from either the City of Gainesville or Alachua County to said Board, but the City and the County shall each continue, until otherwise lawfully determined, to own and operate its own water and sanitary sewer facilities in accordance with the policies, rules and regulations as shall be set by the Board.

4. Approval of Department of Legal Affairs. This agreement shall be immediately submitted to the Department of Legal Affairs of the State of Florida for approval as required by the provisions of Chapter 163.01 (11).

5. Filing with Clerk of Circuit Court and Department of Community Affairs. A copy of this agreement and all subsequent amendments thereto shall be filed with the Clerk of the Circuit Court of Alachua County and with the Department of Community Affairs of the State of Florida.

IN WITNESS WHEREOF the City Commission of the City of Gainesville and the Board of County Commissioners of Alachua County, Florida have entered into this agreement and have caused it to be executed by their duly authorized officers.

ALACHUA COUNTY, a Political subdivision of the State of Florida, BY ITS BOARD OF COUNTY COMMISSIONERS OF ALACHUA COUNTY, FLORIDA

BY s/ _____
CHAIRMAN

Attest: A. CURTIS POWERS
CLERK, CIRCUIT COURT

s/ _____

THE CITY OF GAINESVILLE, a municipal corporation

BY s/ _____
MAYOR-COMMISSIONER

Attest:

s/ _____
CLERK OF THE COMMISSION

APPENDIX D

RULES

OF THE

DEPARTMENT OF AIR AND WATER POLLUTION CONTROL

CHAPTER 17-3

POLLUTION OF WATERS

17-3.01 Declaration and intent
17-3.02 Minimum conditions of all waters; times and places
17-3.03 Water quality testing
17-3.04 General water quality
17-3.05 Water quality standards; specifics
17-3.06 Classification of waters, usage
17-3.07 Criteria: Class I waters — public water supply
17-3.08 Criteria: Class II waters — shellfish harvesting
17-3.09 Criteria: Class III waters — recreation — propagation and management of fish and wildlife
17-3.10 Criteria. Class IV waters — agricultural and industrial water supply
17-3.11 Criteria: Class V waters — navigation, utility and industrial use
17-3.12 Definitions
17-3.13 Drainage wells, permits
17-3.14 Drainage wells, applications
17-3.15 Effective date of permits
17-3.16 Drainage wells, drilling requirements
17-3.17 Drainage well permit revocation or modification
17-3.18 Test wells and borings
17-3.19 Abandoned wells
17-3.20 Pollution surveys
17-3.21 Classified waters

17-3.01 Declaration and intent. The Florida Air & Water Pollution Control Board in order to more properly protect the waters of the State of Florida, declares that the presence of pollutants in excess of concentrations hereinafter provided is harmful to the waters of this State and the presence of such excessive concentrations is deemed to be prima facie evidence of pollution of the waters of the State of Florida and the same is expressly prohibited.

The policy inherent in the standards shall be to protect water quality existing at the time these water quality standards were adopted or to upgrade or enhance water quality within the State of Florida. In any event where a new or increased source of pollution poses a possibility of degrading existing high water quality, such project development shall not be issued a Department permit until the Board is satisfied that such development will not be detrimental to the best interests of the State and necessary to its social and economic development. In administering the policy, high quality receiving waters will be protected by requiring as a part of the initial project design the highest and best practicable treatment available under existing technology.

The Board recognizes and will protect the interest of the Federal Government in interstate and coastal waters in accordance with the Federal Water Pollution Control Act, as amended. The Board further shall consult with the U.S. Department of the Interior on all matters affecting the Federal interest in a cooperative effort.

It is the intent of the State of Florida to review Class V stream classifications periodically as often as necessary, and as water quality of such areas improves, hearings will be held and reclassification shall be established. It is expected that in all instances presently classified as Class V. Waters, there shall be decided and definitive enhancement not later than January 1, 1973.

General Authority 403.061 FS. Law Implemented 403.021, 403.061, 403.101 (1), 403.182, 403.261 FS. History—Amended 3-21-68, 1-17-69.

17-3.02 Minimum conditions of all waters; times and places.

The following minimum conditions are applicable to all waters, at all places and at all times. Within the territorial limits of this state all such waters shall be free from:

(1) Settleable Substances — substances attributable to municipal, industrial, agricultural, or other discharges that will settle to form putrescent or otherwise objectionable sludge deposits.

(2) Floating Substances — floating debris, oil, scum, and other floating materials attributable to municipal, industrial, agricultural, or other discharge in amounts sufficient to be unsightly or deleterious.

(3) Deleterious Substances — materials attributable to municipal, industrial, agricultural or other discharges producing color, odor, or other conditions in such degree as to create a nuisance.

(4) Toxic Substances — substances attributable to municipal, industrial, agricultual, or other discharges in concentrations or combinations which are toxic or harmful to humans, animal, plant, or aquatic life.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 (1) FS. History—Amended 3-21-68, 1-17-69, 10-28-70.

17-3.03 Water quality testing. Tests or analytical procedures to determine compliance or noncompliance with water quality criteria provided by this chapter shall be in accordance with methods given in the latest edition of Standard Methods for the Examination of Water and Wastewater, published by the American Public Health Association, American Water Works Association and Water Pollution Control Federation; and a copy of same shall be avaliable for public inspection at the offices of the Air & Water Pollution Control Board. Where other tests or analytical procedures are found to be more satisfactory, such tests or procedures will be used only upon the acceptance and approval by the regulatory agency.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS.

17-3.04 General water quality.

(1) Sewage, Industrial Wastes or Other Wastes — Any industrial wastes or other wastes shall be effectively treated by the latest modern technological advances as approved by the regulatory agency.

All discharges from municipal and privately owned domestic waste plants will comply with the Water Quality Standards of the State of Florida with 90% treatment or better as expeditiously as possible, but not later than January 1, 1973, except that those plants discharging sanitary sewage through ocean outfalls or disposal wells must provide for at least 90% treatment or better as deemed necessary by the Department not later than January 3, 1974.

The degree of treatment for industrial waste has been further defined as follows: That which provides an effluent equivalent to that produced by the highest quality municipal waste treatment, but in no case shall the effeciency be less than 90% organic removal. In some cases, due to waste characteristics, it will be necessary that the efficiency exceed 90%. In the case of inorganic wastes, waste treatment shall have similar efficiencies. The 90% organic and inorganic removal factor shall be applied against the total untreated waste produced by a given plant. All discharges from industrial waste treatment plants shall attain such treatment efficiency as expeditiously as possible, but not later than January 1, 1973.

(2) Chemical Constituents and Compounds — Presence of certain other elements, organic and inorganic compounds are recognized to affect water quality and aquatic life. These substances often occur naturally in streams or lakes and may be difficult to measure accurately and their effects are usually indirect or accentuated when found in combination with substances or conditions listed in the established criteria.

(3) When any of the constituents listed below occur in any amounts in any individual body of water, they shall be suspected of degrading the quality of the particular lake or stream. As improvement in analytical technique dictate, exact numerical threshold criteria may be established, but the same shall not be limited to the following:

Sulfates	Free Mineral Acids
Sulfides	Nitrates
Nickel	Phosphates
Aluminum	Potassium

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS. History—Amended 3-21-68, 10-28-70.

17-3.05 Water quality standards; specifics.

(1) The criteria of water quality hereinafter provided will be applied only after reasonable opportunity for mixture of wastes with receiving waters has been afforded; the reasonableness of the opportunity for mixture of wastes and receiving waters shall be determined on the basis of the physical characteristics of the receiving waters and the methods in which the discharge is physically made shall be approved by the regulatory agency.

(2) The following water quality standards shall be the criteria for pollution when concentrations exceed following limitations:

(a) Fluorides — shall not exceed 1.4 to 1.6 mg/1 as fluoride ion, depending on annual average daily air temperature for at least a five-year period for sources of Class I public water supplies measured immediately above or adjacent to raw water intake.

(b) Fluorides — for waters not used for public water supplies, shall not exceed 10.0 mg/1 as fluoride ion or will not interfere with other beneficial uses.

(c) Chlorides — chlorides shall not exceed two hundred fifty (250) mg/1 in streams considered to be fresh water streams; in other waters of brackish or saline nature the chloride content shall not be increased more than ten per cent (10%) above normal background chloride content.

(d) Turbidity — shall not exceed fifty (50) Jackson units as related to standard candle turbidimeter above background.

(e) Dissolved Oxygen — shall not be artificially depressed below the values of four (4.0) ppm (unless background information available to the regulatory agency indicates prior existence under unpolluted conditions of lower values.) In such cases, lower limits may be utilized after approval by the regulatory authority.

(f) BOD — shall not be altered to exceed values which would cause dissolved oxygen to be depressed below the limit listed above and, in no case, shall it be great enough to produce nuisance conditions.

(g) Temperature — shall not be increased so as to cause any damage or harm to the aquatic life or vegetation of the receiving waters or interfere with any beneficial use assigned to such waters.

(h) Dissolved Solids — not to exceed five hundred (500) mg. per liter as a monthly average or exceed one thousand (1,000) mg. per liter at any time.

(i) Specific Conductance — shall not be increased more than one hundred per cent (100%) above background levels or to a maximum level of 500 micromhos per centimeter (cm) for streams considered to be fresh water streams.

(j) Radioactive Substances, Gross Beta Activity — (in known absence of strontium — 90 and alpha emitters), not to exceed one thousand (1,000) micromicrocuries at any time. See also Chapter 170C-1.

(k) Cyanide or Cyanates — none detectable.

(l) Copper — shall not exceed 0.5 mg/1

(m) Zinc — shall not exceed 1.0 mg/1

(n) Chromium — shall not exceed 0.50 mg/1 hexavalent or 1.0 mg/1 total chromium in effluent discharge and shall not exceed 0.05 mg/1 after reasonable mixing in the receiving stream.

(o) Phenolic type compounds calculated or reported as phenol — shall not exceed 0.001 mg/1

(p) Lead — shall not exceed 0.05 mg/1

(q) Iron — shall not exceed 0.30 mg/1

(r) Arsenic — shall not exceed 0.05 mg/1

(s) Oils and Greases — shall not exceed fifteen (15) mg/1, or that no visible oil, defined as iridescence, be present to cause taste and odors, or interfere with other beneficial uses.

(t) pH — of receiving waters shall not be caused to vary more than one (1.0) unit above or below normal pH of the waters; and lower value shall be not less than six (6.0), and upper value not more than eight and one-half (8.5). In cases where pH may be, due to natural background or causes, outside limits stated above, approval of the regulatory agency shall be secured prior to introducing such material in waters of the state.

(u) Detergents — shall not exceed one-half (0.5) mg/1

(v) Mercury — non detectable in effluent discharge.

(3) Exceptions — in cognizance of the fact that certain waters of the state, due to natural causes, may not fall within desired or prescribed limitations outlined above, the Board is empowered to authorize exceptions to limitations upon presentation of good and sufficient evidence. In no case shall it be lawful to authorize disposition or introduction of materials in waters of the state which will cause material harm or damage to said waters.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS. History—Amended 3-21-68, 1-17-69, 2-17-71.

17-3.06 Classification of waters, usage.

The waters of Florida are classified according to their usage as follows:

Class I — Public Water Supplies

Class II — Shellfish Harvesting

Class III — Recreation — Propagation and management of fish and wildlife

Class IV — Agricultural and industrial water supply

Class V — Navigation, utility and industrial use

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101(1) FS.

17-3.07 Criteria: Class I waters — public water supply.

The following criteria are for classification of any waters from which water is withdrawn for treatment and distribution as a potable supply.

(1) Sewage, Industrial Wastes, or Other Wastes — any industrial wastes or other wastes shall be effectively treated by the latest modern technological advances as approved by the regulatory agency.

(2) Odor — threshold odor number not to exceed 24 at 60° C as a daily average.

(3) pH — of receiving waters shall not be caused to vary more than one (1.0) unit above or below normal pH of the waters; and lower value shall not be less than six (6.0), and the upper value not more than eight and one-half (8.5). In cases where pH may be, due to natural background or causes, outside limits stated above, approval of the regulatory agency shall be secured prior to introducing such material in waters of the state.

(4) Dissolved Oxygen — shall not be artificially depressed below the values of four (4.0) ppm (unless background information available to the regulatory agency indicates prior existence under unpolluted conditions of lower values.) In such cases, lower limits may be utilized after approval by the regulatory authority.

(5) Toxic Substances — free from substances attributable to municipal, industrial, agricultural or other discharges in concentrations or combinations which are toxic or harmful to humans, animal or aquatic life.

(6) Bacteriological Quality — coliform group not to exceed 1,000 ml as a monthly average, (either MPN or MF counts); nor to exceed this number in more than 20% of the samples examined during any month; nor exceed 2,400 per 100 ml (MPN or MF count) on any day.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS. History—Amended 1-17-69.

17-3.08 Criteria: Class II waters — shellfish harvesting.

The following criteria are for classification of waters in areas to be utilized for shellfish harvesting:

(1) Bacteriological Quality, Coliform Group — areas classified for shellfish harvesting, the median coliform MPN (Most Probable Number) of water cannot exceed seventy (70) per hundred (100) ml., and not more than ten (10) per cent of the samples ordinarily exceed an MPN of two hundred and thirty (230) per one hundred (100) ml. in those portions of areas most probably exposed to fecal contamination during most unfavorable hydrographic and pollutional conditions.

(2) Sewage, Industrial Wastes, or Other Wastes — any industrial wastes or other wastes shall be effectively treated by the latest modern technological advances as approved by the regulatory agency.

(3) pH — of receiving waters shall not be caused to vary more than one (1.0) unit above or below normal pH of the waters; and lower value shall be not less than six (6.0) and upper value not more than eight and one-half (8.5). In cases where pH may be, due to natural background or causes, outside limits stated above, approval of the regulatory agency shall be secured prior to introducing such material in waters of the state.

(4) Temperature — shall not be increased so as to cause any damage or harm to the aquatic life or vegetation of the receiving waters or interfere with any beneficial use assigned to such waters.

(5) Dissolved Oxygen — shall not be artificially depressed below the values of four (4.0) ppm (unless background information available to the regulatory agency indicates prior existence under unpolluted conditions of lower values.) In such cases, lower limits may be utilized after approval by the regulatory authority.

(6) Toxic Substances — free from substances attributable to municipal, industrial, agricultural or other discharges in concentrations or combinations which are toxic or harmful to humans, animal or aquatic life.

(7) Odor — threshold odor number not to exceed 24 at 60°C as a daily average.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS. History—Amended 3-21-68, 1-17-69.

17-3.09 Criteria: Class III waters — recreation — propagation and management of fish and wildlife.

The following criteria are for classification of waters to be used for recreational purposes, including such body contact activities as swimming and water skiing; and for the maintenance of a well-balanced fish and wildlife population. All coastal and beach waters, including off-shore waters, not otherwise

classified shall be classified as Class III; however, waters of the open ocean shall be maintained at a dissolved oxygen of not less than five (5.0) ppm. Streams specifically listed in Section 17-3.21 by a separate listing designated as "Special Stream Classification" shall similarly be maintained at a minimum dissolved oxygen of five (5.0) ppm.

(1) Sewage, industrial wastes, or other wastes — any industrial waste or other wastes shall be effectively treated by the latest modern technological advances as approved by the regulatory agency.

(2) pH — of receiving waters shall not be caused to vary more than one (1.0) unit above or below normal pH of the waters, and lower value shall be not less than (6.0), and upper value not more than eight and one-half (8.5) In cases where pH may be, due to natural background or causes outside limits stated above, approval of the regulatory agency shall be secured prior to introducing such material in waters of the state.

(3) Dissolved Oxygen — shall not be artificially depressed below the values of four (4.0) ppm (unless background information available to the regulatory agency indicates prior existence under unpolluted conditions of lower values). In such cases, lower limits may be utilized after approval by the regulatory authority.

(4) Bacteriological — coliform group not to exceed 1,000 per 100 as a monthly average, (either MPN or MF counts); nor to exceed this number in more than 20% of the samples examined during any month; nor exceed 2,400 per 100 ml (MPN or MF count) on any day. This criteria shall apply only to waters used for body contact activities.

(5) Toxic substances — free from substances attributable to municipal, industrial, agricultural or other discharges in concentrations or combinations which are toxic or harmful to humans, animal or aquatic life.

(6) Deleterious — free from materials attributable to municipal, industrial, agricultural, or other discharges producing color, odor or other conditions in such degree as to create a nuisance.

(7) Turbidity — shall not exceed fifty (50) Jackson units as related to standard candle turbidimeter above background.

(8) Temperature — shall not be increased so as to cause any damage or harm to the aquatic life or vegetation of the receiving waters or interfere with any beneficial use assigned to such waters.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS. History—Amended 3-21-68, 1-17-69.

17-3.10 Criteria: Class IV waters — agricultural and industrial water supply.

The following criteria are for classification of waters to be used for agricultural or stock watering, or industrial water supply.

(1) Sewage, industrial wastes or other wastes — none which are not effectively treated or controlled to the satisfaction of the regulatory agency.

(2) pH — not more than one (1.0) unit from the normal or not less than six (6.0) nor greater than 8.5.

(3) Temperature — shall not be increased so as to cause any damage or harm to the aquatic life or vegetation of the receiving waters or interfere with any beneficial use assigned to such waters.

(4) Dissolved oxygen — shall not be depressed below the values of four (4.0) ppm (unless background information available to the regulatory agency indicates prior existence under unpolluted conditions of lower values). In such cases, lower limits may be utilized after approval by the regulatory authority.

(5) Color, odor, and taste producing substances and other deleterious substances, including other chemical compounds, attributable to domestic wastes, industrial wastes, and other wastes — only such amounts as will not render the waters unsuitable for agricultural irrigation, livestock watering, industrial cooling, industrial process water supply purposes and fish survival.

(6) Turbidity — shall not exceed fifty (50) Jackson units as related to standard candle turbidimeter above background.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS. History—Amended 3-21-68, 1-17-69.

17-3.11 Criteria: Class V waters — navigation, utility and industrial use.

The following criteria are for classification of waters which will be suitable for navigation and any other uses except for waters previously classified in this Chapter:

(1) Sewage, Industrial or Other wastes — none which are not effectively treated or controlled to the satisfaction of the regulatory agency.

(2) pH — not lower than 5.0 nor greater than 9.5 except certain swamp waters which may be as low as 4.5.

(3) Dissolved oxygen — sufficient to be aerobic. The term "aerobic" is defined as "being not less than one (1.) ppm with an average value of not less than two (2.0)ppm."

(4) Odor producing substances — only in such amounts that will not unreasonably interfere with the use of the water for the designated purpose of this classification.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS. History—Amended 3-21-68.

17-3.12 Definitions.

(1) Definitions of technical terms used shall be in accordance with the glossary — water and sewage control engineering, standard methods for the examination of water and wastewater and the condensed chemical dictionary.

(2) Drainage well shall be considered to have the same meaning as absorbing well.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.101 FS.

17-3.13 Drainage wells, permits. Before any municipal or private corporation or persons shall use an existing well or sink, drive or drill a new well for discharge of sewage or surface water, the owner of existing well or well drilling contractor and owner of property in the case of a new well shall apply to the Department for a permit authorizing drilling and use of said well.

General Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061, 403.182 FS.

17-3.14 Drainage well, applications.

Application for drainage well permit shall be on form supplied by the Board and accompanied by the following data:

(1) Completed report of inspection by county or regional sanitary engineer.

(2) Location and depth of well and depth of casing of all water supply wells within one (1) mile radius of proposed well.

(3) Nature of waters to be discharged into proposed drainage well including analysis thereof, source, estimated quantity and pertinent bacteriological analyses if deemed necessary by the Board.

(4) If transmittal ditches or depressions are used to allow flow of surface or other waters to the well, a complete drawing of drained area shall be supplied and considered a part of drainage structure.

(5) If drainage well or drainage structure will present possible pollution hazard to underground water or water supply wells within one (1) mile thereof, additional data may be requested.

(6) All applications shall be signed by the well drilling contractor and owner of property where proposed well or drainage structure is located or his duly authorized agent.

(7) In all cases except for wells to receive condenser cooling waters or where receiving aquifer or aquifers contain fifteen hundred (1500) parts per million or more of chlorides, bacteriological examination must be made of water from all water supply wells within one (1) mile radius that are drilled to approximate depth of proposed drainage well. The bacteriological survey shall be conducted in following manner:

(a) Samples shall be collected from each well for the first three (3) days of each week for period of four (4) weeks.

(b) Duplicate samples shall be collected in each case after well has been pumped at least twenty (20) minutes. Whenever a drainage well installation is approved following preliminary bacteriological survey of neighboring water supply wells, an identical survey of the same well shall be conducted following opening of drainage well.

General Authority 403.061 FS. Law Implemented 403.021, 403.061, 403.101, 403.182 FS.

17-3.15 Effective date of permits. No permit for operation or drilling of a drainage well shall become effective or operative until filed with the clerk of the circuit court as required in Section 387.03 FS.

General Authority 403.061 FS. Law Implemented 403.021, 403.061, 403.182 FS.

17-3.16 Drainage wells, drilling requirements.

(1) A log showing various strata pierced by the well shall be forwarded to the Department within two (2) days after completion of drilling operation.

(2) Samples of strata formations pierced in drilling shall be forwarded to the state geologist, P.O. Drawer 631, Tallahassee, when drilling is completed.

(3) If casing is used within the well it shall be first-quality lap-welded pipe only. Use of butt welded pipe is prohibited.

(4) Practice of dynamiting clogged wells shall not be resorted to except upon written permission of the Board.

General Authority 403.061 FS. Law Implemented 403.021, 403.061, 403.101, 403.182 FS.

17-3.17 Drainage well permit revocation or modification. Drainage well permits are revocable or subject to modification by the Board in accordance with provisions of Section 387.03 and Sections 120.20 through 120.28 FS. Pumping into drainage wells unless specifically authorized in permit will constitute violation of permit and be cause for permit revocation.

General Authority 403.061 FS. Law Implemented 403.021, 403.061, 403.182 FS.

17-3.18 Test wells and borings. Test wells or borings shall be filled with concrete within five (5) days after completion of testing purposes for which it was drilled. Such test wells or borings shall not be used as drainage wells unless permit has been obtained in accordance with this chapter. Failure to obtain permit prior to drilling of said well or boring shall bar future use except for tesing purposes not connected with drainage in any manner whatsoever.

General Authority 403.061 FS. Law Implemented 403.021, 403.061, 403.101, 403.182 FS.

17-3.19 Abandoned wells. Within ten (10) days after abandonment of drainage wells they shall be backfilled from bottom to top with neat cement grout.

General Authority 403.061 FS. Law Implemented 403.021, 403.061 FS.

17-3.20 Pollution surveys. Surveys of surface waters including treatment plant effluents shall be made in accordance with good sanitary engineering practice and shall be of sufficient scope to provide information as requested by the Board in cases where the Board deems such survey necessary to provide information relative to request for additional loading on sewage treatment plant or evaluate effect of such existing facilities on receiving waters. Such surveys shall take into account factors such as physical, chemical, biological and bacteriological which are pertinent.

General Authority 403.061 FS. Law Implemented 403.021, 403.061, 403.101, 403.182 FS.

17-3.21 Classified waters. Pursuant to the criteria of water classification, Sections 17-3.06 through 17-3.11, inclusive, the waters of the State of Florida are classified by river basins or sub-basins (classifications are not printed in the Code pursuant to Section 120.051 (1) (e), Florida Statutes, but as filed are of full force and effect.)

General Authority 403.061 FS. Law Implemented 403.021, 403.061 FS.

APPENDIX E

CONTRACT FOR PERSONAL SERVICES

THIS AGREEMENT, entered into as of this 1st day of June, 1973, by and between the North Central Florida Regional Planning Council, Gainesville, Florida, (herein called the "Council") and Sverdrup & Parcel and Associates, Inc., 2512 S.W. 34 Street, Gainesville, Florida, (herein called the "Engineer"),

WITNESSETH THAT:

WHEREAS the Council desires to engage the Engineer to render certain technical and professional services hereafter described and the Engineer agrees to furnish such services:

NOW, THEREFORE, the parties hereto mutually agree as follows:

1. **Employment of the Engineer.** The Council hereby agrees to engage the Engineer and the Engineer hereby agrees to perform the services hereinafter set forth and designated as the "Project."

2. **Project and Project Area.** The Project consists of the preparation and submission of a comprehensive drainage and flood plain designation plan for the Gainesville, Florida Metropolitan Area.

   The Engineer shall perform all necessary services provided under this contract with and respecting the 135 square mile HUD area in and adjacent to Gainesville, Florida, except that drainage basins not adequately covered by the topographic maps described in this Contract may be deleted, provided such coverage is not shown on existing U. S. Geological Survey quadrangles.

3. **Scope of Services.** The Engineer shall do, perform, and carry out, in a satisfactory and proper manner, the following services in the study area.

   A. Prepare, to the satisfaction of the Council, an outline of the services to be furnished.

   B. Collect basic data including, but not limited to, the following:

      (1) Purchase one recording raingage and two water level recorders for flow measurements.

      (2) Select test basins for runoff studies, construct flow measuring structures, and install water level recorders at each of the two test basins. Sites to be selected for different soil types.

(3) Install raingage in test basin area.

(4) Select test basins for infiltration studies and construct and calibrate a staff gage in the basin at each of three (minimum) test basins. Sites to be selected for different soil types.

(5) Monitor all rainfall, runoff and infiltration stations until November 1, 1973.

(6) Obtain concurrent and historical rainfall data from U. S. Weather Bureau and University of Florida and obtain concurrent and historical stream flow data from the U. S. Geological Survey.

(7) Using field reconnaissance methods, locate and assess basins which contain solution caverns.

(8) Locate and measure all major water control structures, which shall be considered as primary drainage structures because of their location and importance in the overall drainage system.

(9) Recommendations for a continuing program of basic data collection and analysis to verify the rainfall—runoff criteria utilized in the study.

C. Analyze basic data including, but not limited to, the following:

(1) Prepare piezometric map to determine influence of ground water levels on infiltration.

(2) Establish area and soil types of test basins.

(3) Reduce rainfall—runoff data to runoff coefficients for soil types studied.

(4) Compute infiltration rates for test basins.

D. Apply basic data to determine the flood channel area for streams and the flood plain area for streams and depressions as follows:

(1) Obtain and review information on the City of Gainesville flood plain program and incorporate same in this study, where applicable.

(2) Establish the drainage divide, measure the surface area and determine the predominate soil type and runoff coefficient for each drainage basin.

(3) Estimate from the Gainesville and Alachua County land use plans the degree of future development in each drainage basin.

(4) Utilizing the U. S. Weather Bureau Technical Paper No. 40 data, establish the following:

(a) The flood channel area and flow rate based on the 10-year rainfall using the existing degree of development in the basins.

(b) The flood channel area and flow rates based on the 10-year rainfall using a reasonable estimate of the future degree of development in the basins.

(c) The flow rates at critical points in each basin which will result from the 25-year rainfall using a reasonable estimate of the future degree of development in the basins.

(d) The flood plain area based on the 100-year rainfall using the existing degree of development in the basins.

(e) The flood plain area based on the 100-year rainfall using a reasonable estimate of the future degree of development in the basins.

(5) Transfer the information obtained in 3.D.(4), above, to one set of mylar reproducible topographic maps as furnished by the Council.

E. Prepare recommendations for flood plain channel management.

F. Prepare a water management plan including, but not limited to, the following:

(1) Identify and describe existing land developments that lie in flood channel or plain areas.

(2) Prepare preliminary layouts, designs and cost estimates of facilities to alleviate flooding of areas identified under 3.F.(1), above. All reasonable alternate methods are to be considered, and a brief outline of the environmental aspects of each alternate will be presented.

(3) Present recommendations for a definite water management plan, including steps that may be required to resolve legal questions concerning plan implementation.

G. Present data in 3.F., above, in sufficient detail to permit the Council to update, alter or revise as necessary any part of the water management plan.

H. Prepare and present written reports, together with supporting data, exhibits, charts, and tables, in the indicated number for the following:

(1) Quarterly progress reports—25 copies.

(2) An interim report at the conclusion of services under 3.A. through 3.C. above—25 copies.

(3) A final report at the conclusion of services under 3.A. through 3.G., above—150 copies, together with one set only of mylar reproducible topographic maps as furnished by the Council and as prepared under 3.D.(5), above.

I. The Engineer will use computer techniques to determine the flood channel and plain areas and will provide the Council with one copy of the computer program and one complete set of computer cards used by the Engineer therefore.

4. **Responsibilities of the Council.** The responsibilities of the Council shall be:

A. To furnish the Engineer without charge one set of mylar reproducible topographic maps, at a scale of 1"=100' or 1"=200', covering the Project area.

B. To obtain permission for the Engineer to construct and operate test facilities on private property.

C. To furnish the Engineer without charge all information, data, reports, records, and maps as are existing, available, and necessary for the carrying out of the work and to cooperate with the Engineer in every way possible in the carrying out of the Project.

5. **Personnel.**

A. The Engineer represents that he has, or will secure at his own expense, all personnel required in the performing the services under this Contract. Such personnel shall not be employees of or have any contractual relationship with the Council.

B. All of the services required hereunder will be performed by the Engineer or under his supervision, and all personnel engaged in the work shall be fully qualified and shall be authorized under State and local law to perform such services.

C. None of the work or services covered by this Contract shall be subcontracted without the prior written approval of the Council.

6. **Time of Performance.** The services of the Engineer are to commence as soon as practicable after the execution of this Contract and shall be undertaken and completed in such sequence as to assure their expeditious completion in the light of the purposes of this Contract, but in any event all of the services required hereunder shall be completed within *230* consecutive calendar days from the date that the authorization described in 7.E., below, is issued to the Engineer.

7. **Payment for Engineering Services.** Payment to the Engineer for services provided under this Contract will be based on the Engineer's total payroll cost of salaries and wages of principals and employees assigned to the Project, times a factor of 2.10 to provide for general overhead and profit, plus the actual cost of reimbursable expenses as defined hereinafter.

   A. Payroll cost shall include salaries and wages plus salary related expenses including, but not limited to, social security contributions, unemployment, excise and payroll taxes, workmen's compensation, health and retirement benefits, pensions, sick leave, vacation and holiday pay.

   B. Reimbursable expenses shall mean the actual expense of transportation and subsistence of principals and employees when traveling in connection with the Project, supplies and equipment, toll telephone calls and telegrams, reproduction of reports, drawings and exhibits, and similar Project related items.

   C. The Engineer will provide a monthly invoice to the Council itemizing work items accomplished together with all costs incurred during the period covered by the invoice. The Engineer will make available during regular office hours and on request all financial records on the Project to authorized legal or bookkeeping personnel of the Council. Payment to the Engineer shall be made within 30 days after date of invoice.

   D. Execution of this Contract will authorize the Engineer to proceed with the services specified in 3.A., 3.B., 3.C. and 3.H.(2), above, and the Engineer shall complete such services for an amount not to exceed $40,000.00.

   E. Upon receipt of written authorization from the Council, the Engineer will proceed with the additional services that are specified by such authorization and in accordance with the terms of this Contract.

   F. The Engineer shall complete all services in 3., above, for an amount not to exceed $250,000.00.

8. **Termination of Contract for Cause.** If, through any cause, the Engineer shall fail to fulfill in timely and proper manner his obligations under this Contract, or if the Engineer shall violate any of the covenants, agreements, or stipulations of this

Contract, the Council shall thereupon have the right to terminate this Contract by giving written notice to the Engineer of such termination and specifying the effective date thereof, at least 10 days before the effective date of such termination. In that event, copies of all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Engineer under this Contract shall be furnished to the Council at its option, except that the mylar topographic maps shall be returned to the Council, and the Engineer shall be reimbursed in accordance with the provisions of 7., above.

9. **Termination for Convenience of the Council.** The Council may terminate this Contract at any time by giving written notice to the Engineer of such termination and specifying the effective date thereof at least 15 days before the effective date of such termination. In that event copies of all finished and unfinished documents and other records prepared by the Engineer under this Contract shall be furnished to the Council at its option, except that the mylar topographic maps shall be returned to the Council, and the Engineer shall be reimbursed in accordance with the provisions of 7., above.

10. **Changes.** The Council may, from time to time, require changes in the scope of the services of the Engineer to be performed hereunder. Such changes, which are mutually agreed upon by and between the Council and the Engineer, shall be incorporated in written amendments to this Contract.

11. **Equal Employment Opportunity.** The Engineer will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Engineer shall take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such actions shall include, but not be limited to the following: employment, upgrading, demotions, or transfers, recruitment or recruitment advertising; layoffs or terminations; rates of pay or other forms of compensation; selection for training including apprenticeship; and participation in recreational and educational activities. The Engineer agrees to post in conspicuous places available to employees and applicants for employment notices to be provided setting forth the provisions of this non-discrimination clause. The Engineer will in all solicitations or advertisements for employees placed by or on behalf of the Engineer, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

12. **Interest of Members of the Council and Others.** No officer, member, or employee of the Council and no members of its governing body, and no other public official of the governing body of the locality or localities in which the Project is situated or being carried out who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of this Project, shall participate in any decision relating to this Contract which affects his personal interest or the interest of

any corporation, partnership, or association in which he is, directly or indirectly interested or have any personal or pecuniary interest, direct or indirect, in this Contract or the proceeds thereof.

13. **Assignability.** The Engineer shall not assign any interest in this Contract, and shall not transfer any interest in the same (whether by assignment of novation), without the prior written consent of the Council thereto: Provided, however, that claims for money due or to become due to the Engineer from the Council under this Contract may be assigned to a bank, trust company or other financial institution without such approval. Notice of any such assignment or transfer shall be furnished promptly to the Council.

14. **Interest of Engineer.** The Engineer covenants that he presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed under this Contract. The Engineer further covenants that in the performance of this Contract no person having any such interest shall be employed.

15. **Ownership of Equipment.** Under Section 3.B.(1) the Engineer is to purchase at Council's expense one recording raingage and two water level recorders. This equipment will be owned by the Council and will be returned to the Council in good condition less normal wear and tear by the Engineer on or before the completion of the Contract. While in the Engineer's possession, he will provide insurance coverage on the equipment to protect the Council from loss of or damage to said equipment. In the event the equipment is lost or damaged, the Council will be entitled to the insurance proceeds received therefore.

16. **Publication, Reproduction and Use of Material.** The Engineer shall not subject any material produced in whole or in part under this Contract to copyright in the United States or any other country, unless written permission to do so is issued by the Council. The Council shall not unreasonably withhold such permission. The Engineer will furnish the Council at its option copies of all maps, reports and other material resulting from this project, except that the original mylar topographic maps shall be returned to the Council. However, the Engineer shall retain the right to utilize such material for the preparation of technical documents of any kind and for in-house reference. The Engineer agrees that he will not produce for his personal use reproducible copies of the mylar topographic maps furnished by the Council.

17. The Engineer agrees to hold the Council harmless from any and all liability for damage to person or property occasioned by any action of the Engineer, his agents, servants or employees while in the performance of any and all services under this Contract. In addition, the Engineer shall at all times during the term hereof maintain adequate liability insurance for this purpose.

IN WITNESS WHEREOF the parties hereto have made and executed this Contract the day and year first above written.

COUNCIL:

NORTH FLORIDA REGIONAL
PLANNING COUNCIL

BY: s/ _____
Chairman

ENGINEER:

SVERDRUP & PARCEL AND
ASSOCIATES, INC.

BY: s/ _____
Assistant Vice President

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